Controls Operation and Troubleshooting

CONTENTS

SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roof, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start up, and service this equipment. When working on this equipment, observe precautions in the literature, and on tags, stickers, and labels attached to the equipment, and any other safety precautions that apply. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling,

rigging, and setting this equipment, and in handling all electrical components.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. Use lock out/tag out procedures and be aware that there may be more than one disconnect switch. Be sure to tag all disconnect locations to alert others not to restore power until work is completed. Even when the main circuit breaker or isolator is switched off, certain circuits may still be energized, since they may be connected to a separate power source.

⚠ WARNING

Electrical currents cause components to get hot either temporarily or permanently and may cause burns. Handle power cable, electrical cables and conduits, terminal box covers, and motor frames with great care.

⚠ CAUTION

This unit uses a microprocessor control system. Do not short or jumper between terminations on circuit boards or modules; control or board failure may result.

Be aware of electrostatic discharge (static electricity) when handling or making contact with circuit boards or module connections. Always touch a chassis (grounded) part to dissipate body electrostatic charge before working inside control center.

Use extreme care when handling tools near boards and when connecting or disconnecting terminal plugs. Circuit boards can easily be damaged. Always hold boards by the edges and avoid touching components and connections.

This equipment uses, and can radiate, radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications. The PIC 5 control boards have been tested and found to comply with the limits for a Class A computing device pursuant to International Standard in North America EN 61000-2/3 which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Always store and transport replacement or defective boards in anti-static shipping bag.

GENERAL

This publication contains operation and troubleshooting information for PIC (Product Integrated Control) 5, a system for controlling two-stage 19XR semi-hermetic centrifugal liquid chillers.

The PIC 5 control system monitors and controls all operations of the chiller. The microprocessor control system matches the capacity of the chiller to the cooling load while providing state-of-the-art chiller protection. The system controls cooling load within the set point plus and minus the dead band by sensing the water or brine temperature and regulating the inlet guide vane via a mechanically linked actuator motor, and regulating VFD (variable frequency drive) speed if the compressor is powered by a variable speed drive. The guide vane is a variable flow pre-whirl assembly that controls the refrigeration effect in the cooler by regulating the amount of refrigerant vapor flow into the compressor. An increase in guide vane opening increases capacity. A decrease in guide vane opening decreases capacity. The microprocessor-based control center protects the chiller by monitoring the digital and analog inputs and executing capacity overrides or safety shutdowns as necessary.

The PIC 5 control system also provides access to a Control Test function covering all outputs except compressor relay outputs.

Abbreviations Used in This Manual — The following abbreviations are used in this manual:

CCN	— Carrier Comfort Network®
CCN mode	— Operating type: CCN
ECDW	— Entering Condenser Water
ECW	— Entering Chilled Water
HGBP	— Hot Gas Bypass
HMI	— Human Machine Interface
I/O	— Input/Output
IOB	— Input/Output Board
ISM	— Integrated Starter Module
LCDW	— Leaving Condenser Water
LCW	— Leaving Chilled Water
LED	— Light-Emitting Diode
LEN	— Local Equipment Network (internal communication linking the main board to slave boards)
MCB	— Main Control Board
RLA	— Rated Load Amps
SRD	— Split Ring Diffuser
TFT	— Thin Film Transistor
VFD	— Variable Frequency Drive
UI	— User Interface

HARDWARE

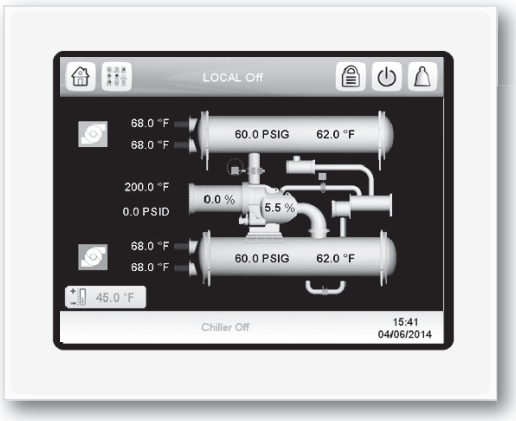
The PIC 5 control system consists of one main control board, an ISM (integrated starter module), and four IOBs (input/output board modules). All boards communicate via an internal LEN bus.

Main Control Board — The main control board is supplied from a 24 VAC supply reference to earth ground. In the event of a power supply interrupt, the unit restarts automatically without the need for an external command. However, any faults active when the supply is interrupted are saved, and may in certain cases prevent a circuit or unit from restarting. Figure 1 shows the main control interface and connectors.

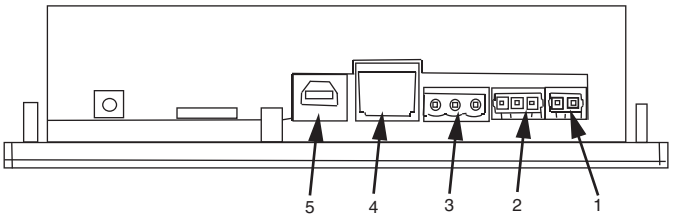
⚠ CAUTION

Maintain the correct polarity when connecting the power supply to the boards. Otherwise, the boards may be damaged.

ISM (Integrated Starter Module) — The ISM is the motor control module, supplied from a 115 VAC supply reference to earth ground. Table 1 lists ISM inputs and outputs. Figures 2-5 show ISM wiring diagrams.



PIC 5 CONTROL INTERFACE



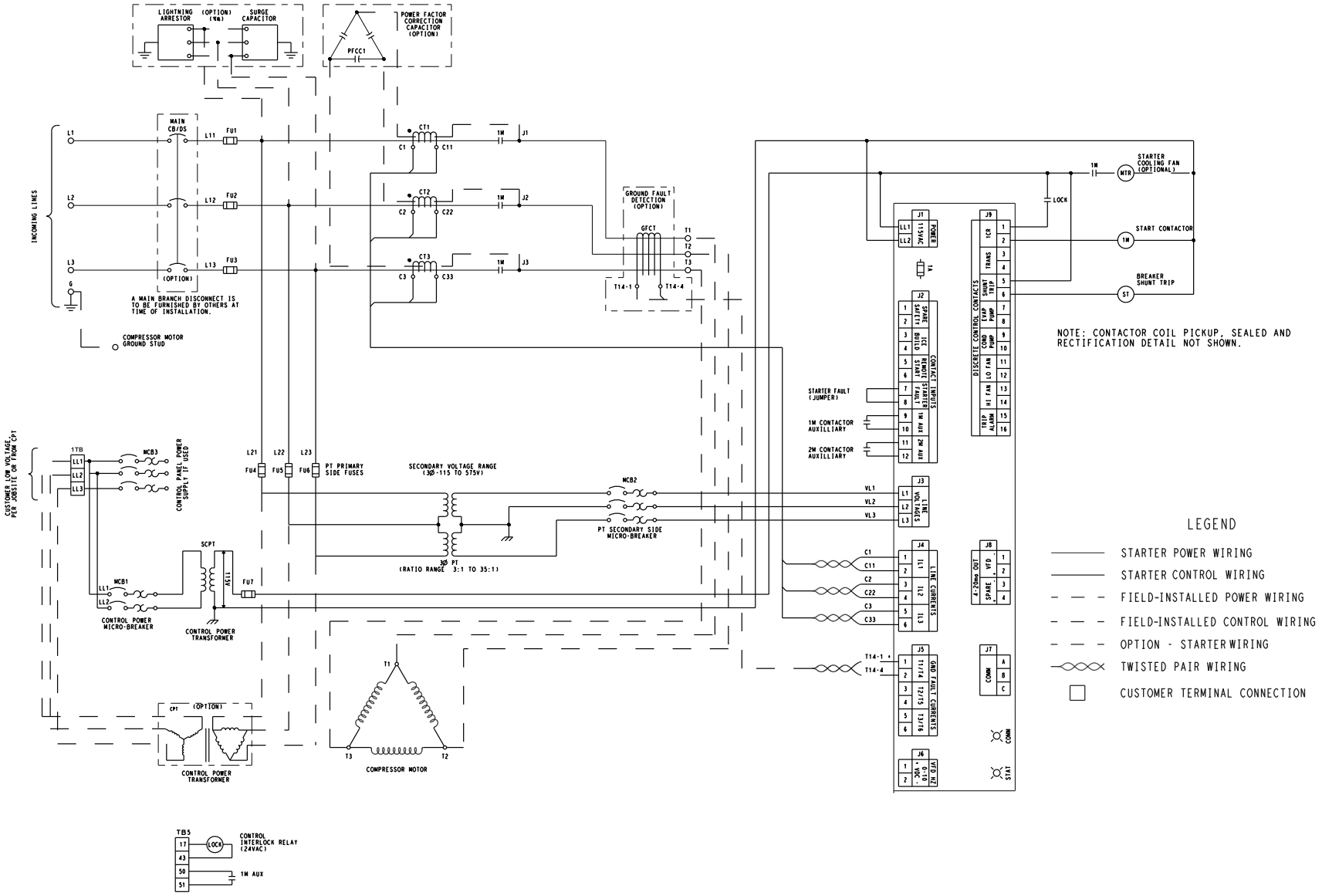
1 - POWER SUPPLY CONNECTOR
2 - LEN CONNECTOR
3 - CCN CONNECTOR
4 - ETHERNET CONNECTOR
5 - USB CONNECTOR

PIC 5 BOTTOM VIEW

Fig. 1 — PIC 5 Control Interface and Connectors

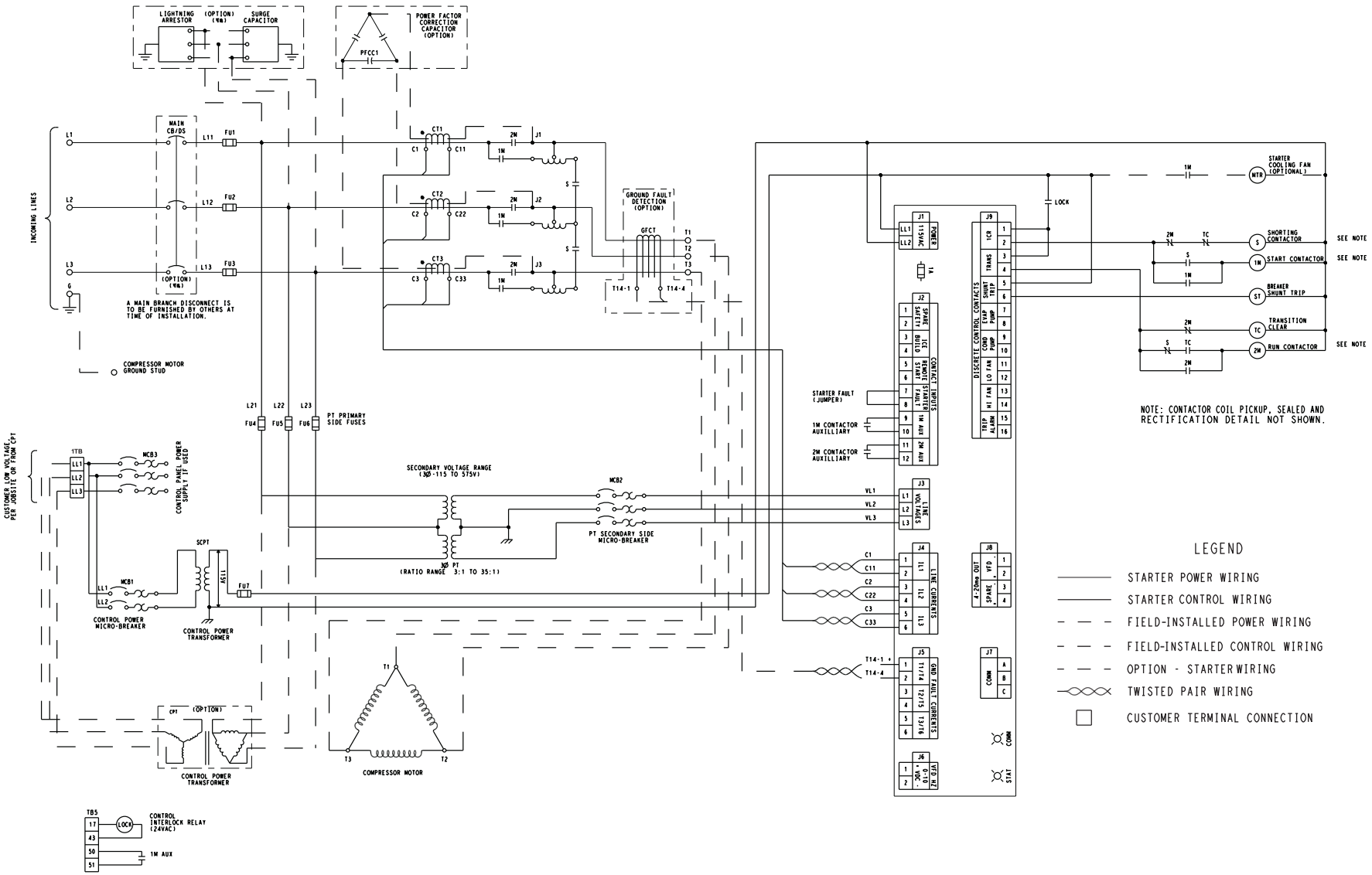
Table 1 — ISM Input/Output Descriptions

DESCRIPTION	POINT NAME	TYPE	PIN NUMBER	INPUT/OUTPUT
Communication	COMM	Dry Contact	J7-A,B,C	Input/Ouput
Compressor Run Contact	RUN_AUX	Dry contact	J2-11,12	Input
Compressor Start Contact	STAR_AUX	Dry contact	J2-9,10	Input
Compressor Start Relay	COMP_SR	Relay	J9-1,2	Output
Compressor Transition Relay	TRANS	Relay	J9-3,4	Output
Ground Fault Phase 1	GRFLT_31	0 to 500 ma (RMS)	J5-1,2	Input
Ground Fault Phase 2	GRFLT_23	0 to 500 ma (RMS)	J5-3,4	Input
Ground Fault Phase 3	GRFLT_12	0 to 500 ma (RMS)	J5-5,6	Input
Line Current C1	LN_AMPS1	0 to 5 A (RMS)	J4-1,2	Input
Line Current C2	LN_AMPS2	0 to 5 A (RMS)	J4-3,4	Input
Line Current C3	LN_AMPS3	0 to 5 A (RMS)	J4-5,6	Input
Line Voltage V1	LN_VOLT1	0 to 575 VAC	J3-1	Input
Line Voltage V2	LN_VOLT2	0 to 575 VAC	J3-2	Input
Line Voltage V3	LN_VOLT3	0 to 575 VAC	J3-3	Input
Shunt Trip Relay	TRIPR	Relay	J9-5,6	Input
Starter Fault	STARTFELT	Dry contact	J2-7,8	Input
VFD Speed Feedback	VFD_IN	0 to 5 V	J6-1,2	Input
VFD Target Speed	VFD_OUT	0 to 20 mA	J8-1,2	Output



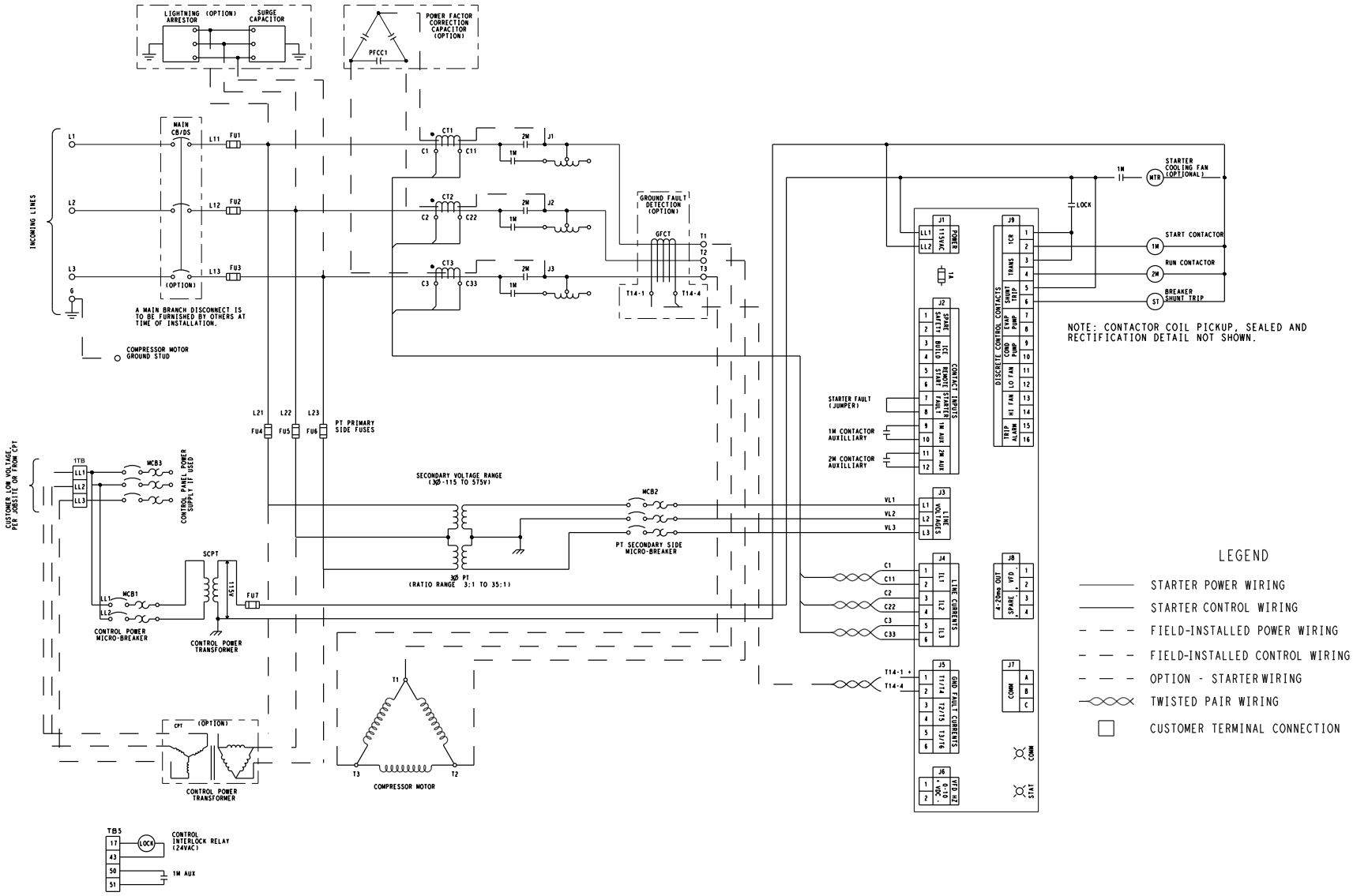
NOTE: This diagram is for reference only. See actual wiring diagram for details.

Fig. 2 — Medium Voltage Across-the-Line ISM (Typical)



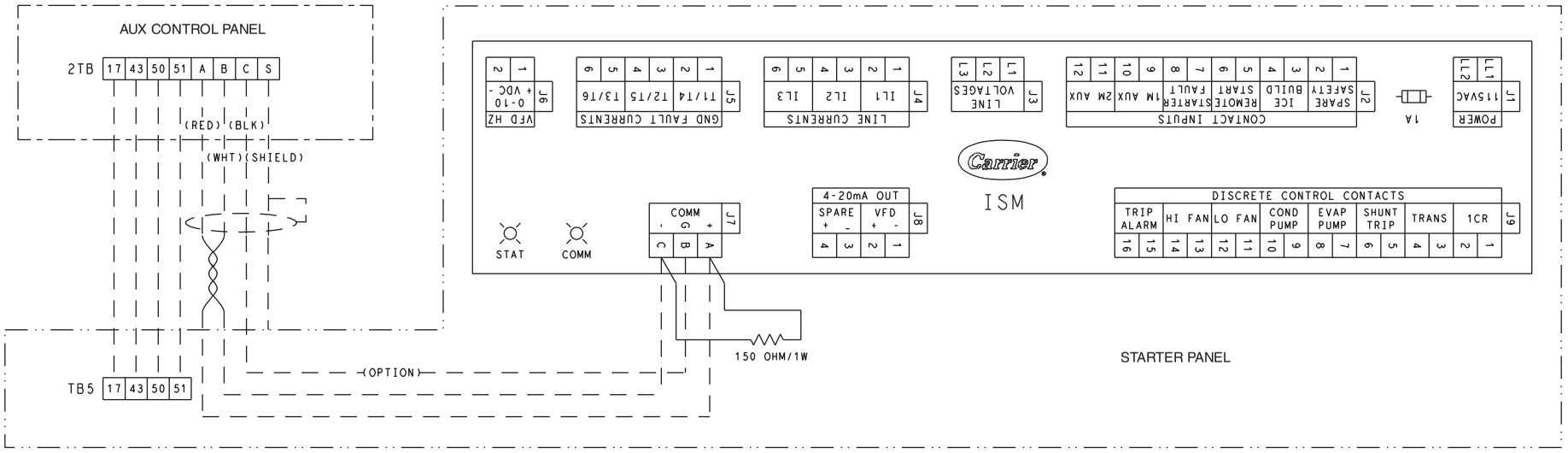
NOTE: This diagram is for reference only. See actual wiring diagram for details.

Fig. 3 — Medium Voltage Autotransformer ISM (Typical)



NOTE: This diagram is for reference only. See actual wiring diagram for details.

Fig. 4 — Medium Voltage Primary Reactor ISM (Typical)



NOTE: SHIELDED CABLE IS RECOMMENDED FOR
THE FIELD CONNECTION BETWEEN 2TB AND TB5.

WARNING! High voltage is present on this board.

Fig. 5 — Starter Field Wiring Schematic

IOB (Input/Output Board) — The IOB is supplied from a 24 VAC supply reference to earth ground. The components listed in Tables 2-5 are available at the user's terminal block on the IOB. Some are available only if the unit is operating in Remote mode. Figures 6-9 show IOB wiring diagrams. Figures 10-13 shows additional control wiring.

LEN Communication Cables — The communication transmission cables have the following electrical characteristics:

- 2 signal conductors and one ground conductor of 20 AWG or larger, 100% shielded
- One tinned copper braid (65% coverage)

Recommended cables are shown below:

USAGE	CABLE
Intra-building	Belden 8772
High temperature	Belden 85240
Plenum	Belden 89418

Table 2 — IOB1 Connections at User's Terminal Block

DESCRIPTION	CHANNEL	TERMINAL	TYPE	OPTIONAL
Entering Chilled Water Temperature	AI1	J16-1,5	5 kΩ	—
Leaving Chilled Water Temperature	AI2	J16-2,6	5 kΩ	—
Entering Condenser Water Temperature	AI3	J16-3,7	5 kΩ	—
Leaving Condenser Water Temperature	AI4	J16-4,8	5 kΩ	—
Evaporator Refrigerant Liquid Temperature	AI5	J15-6,12	5 kΩ	—
Discharge Gas Temperature	AI6	J15-5,11	5 kΩ	—
Condenser Pressure	AI7	J15-4	5 VDC	—
Evaporator Pressure	AI8	J15-3	5 VDC	—
Economizer Pressure	AI9	J15-2	5 VDC	—
Chiller Running (ON=20mA, OFF=4mA, TRIPOUT=8mA, READY=12mA)	AO1	J14-1,4	4-20 mA	Yes
Chiller Lockout Input	DI1	J13-5	24 VAC	Yes
Fire Alarm Interlock	DI2	J13-6	24 VAC	Yes
Remote Contact Input	DI3	J13-7	24 VAC	Yes
Remote Emergency Stop Input	DI4	J13-8	24 VAC	Yes
Stage 1 IGV Increase	DO1	J12-7	24 VAC	—
Stage 1 IGV Decrease	DO2	J12-10	24 VAC	—
Chiller Alarm	DO3	J12-2	24 VAC	Yes
Chiller Alert	DO4	J12-5	24 VAC	Yes

NOTES:
1. See Fig. 6 for IOB1 wiring diagram.
2. For pressure readings, only Vout (output) terminal is indicated. See Fig. 6 for Vin (+) and ground (–).
3. Defaults are shown. In some cases the IOB can be configured differently depending on job requirements.

Table 3 — IOB2 Connections at User's Terminal Block

DESCRIPTION	CHANNEL	TERMINAL	TYPE	OPTIONAL
Motor Winding Temperature 1	AI1	J16-1,5	5 kΩ	—
Motor Winding Temperature 2	AI2	J16-2,6	5 kΩ	—
Motor Winding Temperature 3	AI3	J16-3,7	5 kΩ	—
Oil Sump Temperature	AI5	J15-6,12	5 kΩ	—
Oil Pump Discharge Pressure (Oil Supply)	AI6	J15-5	5 VDC	—
Oil Sump Pressure	AI7	J15-4	5 VDC	—
Demand Limit Input	AI8	J15-3,9	4-20 mA	Yes
Refrigerant Leak Detector	AI9	J15-2,8	4-20 mA	Yes
IGV1 Control Signal	AO1	J14-1,4	4-20 mA	—
Damper Valve Feedback Fully Open	DI1	J13-5	24 VAC	—
Damper Valve Feedback Fully Close	DI2	J13-6	24 VAC	—
High Pressure Switch	DI3	J13-7,3	24 VAC	—
Ice Build Contact	DI4	J13-8,4	24 VAC	Yes
Oil Heater Relay	DO1	J12-7	24 VAC	—
Oil Pump Relay	DO2	J12-10	24 VAC	—
Economizer Damper Valve Open	DO3	J12-2	24 VAC	—
Economizer Damper Valve Close	DO4	J12-5	24 VAC	—

NOTES:
1. See Fig. 7 for IOB2 wiring diagram.
2. For pressure readings, only Vout (output) terminal is indicated. See Fig. 7 for Vin (+) and ground (–).
3. Defaults are shown. In some cases the IOB can be configured differently depending on job requirements.

Table 4 — IOB3 Connections at User's Terminal Block

DESCRIPTION	CHANNEL	TERMINAL	TYPE	OPTIONAL
Bearing Temperature 1	AI1	J16-1,5	5 kΩ	—
Bearing Temperature 2	AI2	J16-2,6	5 kΩ	—
Bearing Temperature 3	AI3	J16-3,7	5 kΩ	—
Bearing Temperature 4	AI4	J16-4,8	5 kΩ	—
Remote Temperature	AI5	J15-6,12	5 kΩ	Yes
IGV1 Position Feedback	AI6	J15-5,11	4-20 mA	—
Auto Water Temperature Reset	AI8	J15-3,9	4-20 mA	Yes
Head Pressure Output	AO1	J14-1,4	4-20 mA	Yes
HGBP Valve Feedback Fully Open	DI1	J13-5	24 VAC	—
HGBP Valve Feedback Fully Close	DI2	J13-6	24 VAC	—
Spare Safety	DI3	J13-7 (4TB-12)	24 VAC	—
Bearing Shaft Displacement Sensor	DI4	J13-8	24 VAC	—
HGBP Solenoid / Open	DO1	J12-7	24 VAC	—
HGBP Close	DO2	J12-10	24 VAC	—

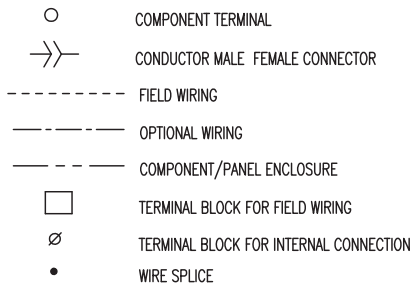
NOTES:
1. See Fig. 8 for IOB3 wiring diagram.
2. For pressure readings, only Vout (output) terminal is indicated. See Fig. 8 for Vin (+) and ground (–).
3. Defaults are shown. In some cases the IOB can be configured differently depending on job requirements.

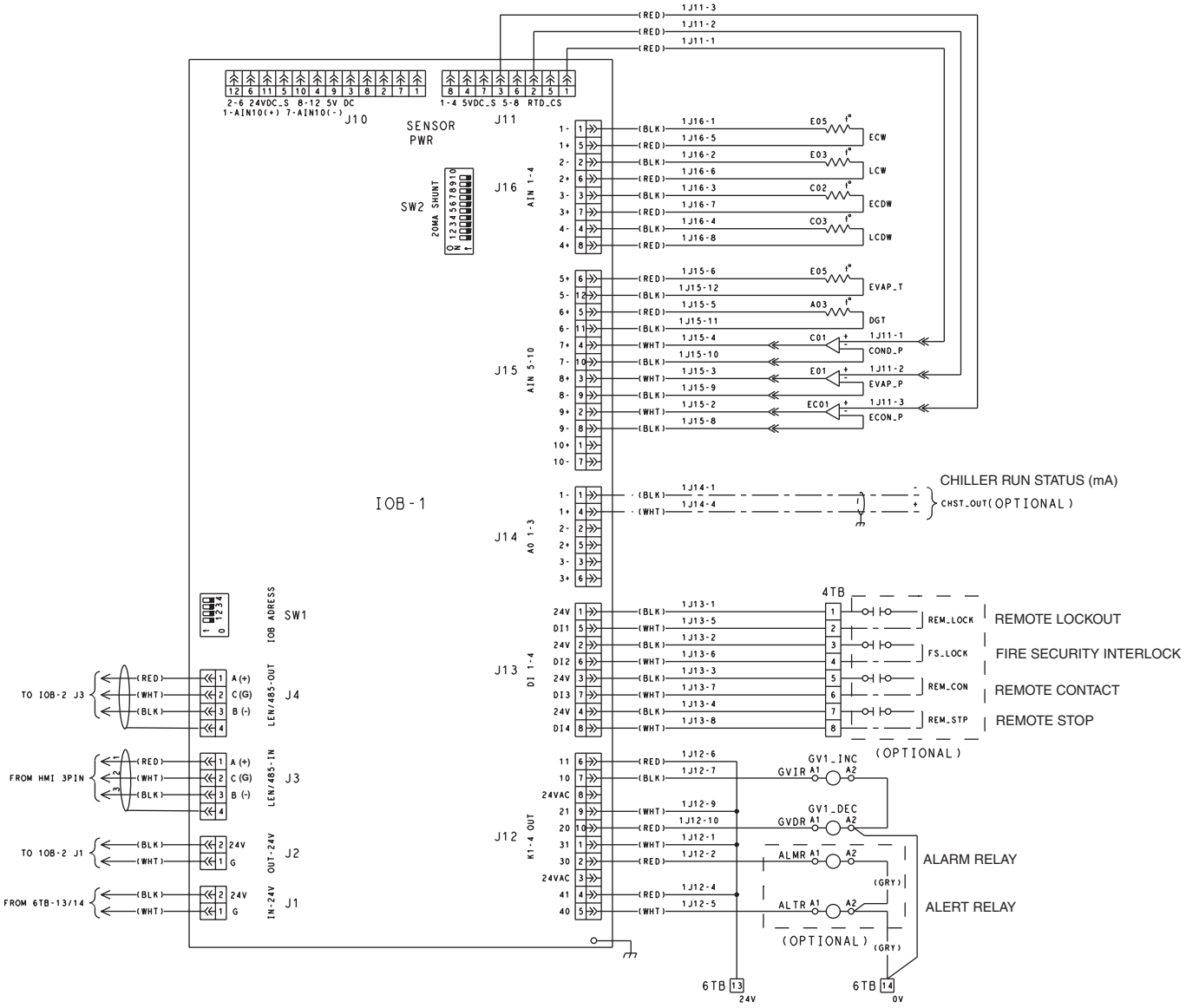
Table 5 — IOB4 Connections at User's Terminal Block

DESCRIPTION	CHANNEL	TERMINAL	TYPE	OPTIONAL
Entering Evaporator Water Pressure	AI3	J16-7	5 VDC	Yes
Leaving Evaporator Water Pressure	AI4	J16-8	5 VDC	Yes
Entering Condenser Water Pressure	AI5	J15-6	5 VDC	Yes
Leaving Condenser Water Pressure	AI6	J15-5	5 VDC	Yes
Chilled Water Pump	DO1	J12-7	24 VAC	Yes
Condenser Water Pump	DO2	J12-10	24 VAC	Yes
Tower Fan High	DO3	J12-2	24 VAC	Yes
Tower Fan Low	DO4	J12-5	24 VAC	Yes
Evaporator Flow Switch	DI1	J13-5	24 VAC	Yes
Condenser Flow Switch	DI2	J13-6	24 VAC	Yes

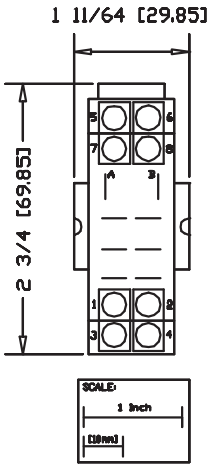
NOTES:
1. See Fig. 9 for IOB4 wiring diagram.
2. For pressure readings, only Vout (output) terminal is indicated. See Fig. 9 for Vin (+) and ground (–).
3. Defaults are shown. In some cases the IOB can be configured differently depending on job requirements.

LEGEND FOR FIG. 6-13





NOTE: A suitable 24 VAC relay is Carrier part number 19XV05005503. Carrier recommends using a relay with a contact rating of 10 amp sealed RMS or greater.



19XV05005503 BASE DIMENSIONS (REFERENCE)

Fig. 6 — IOB 1

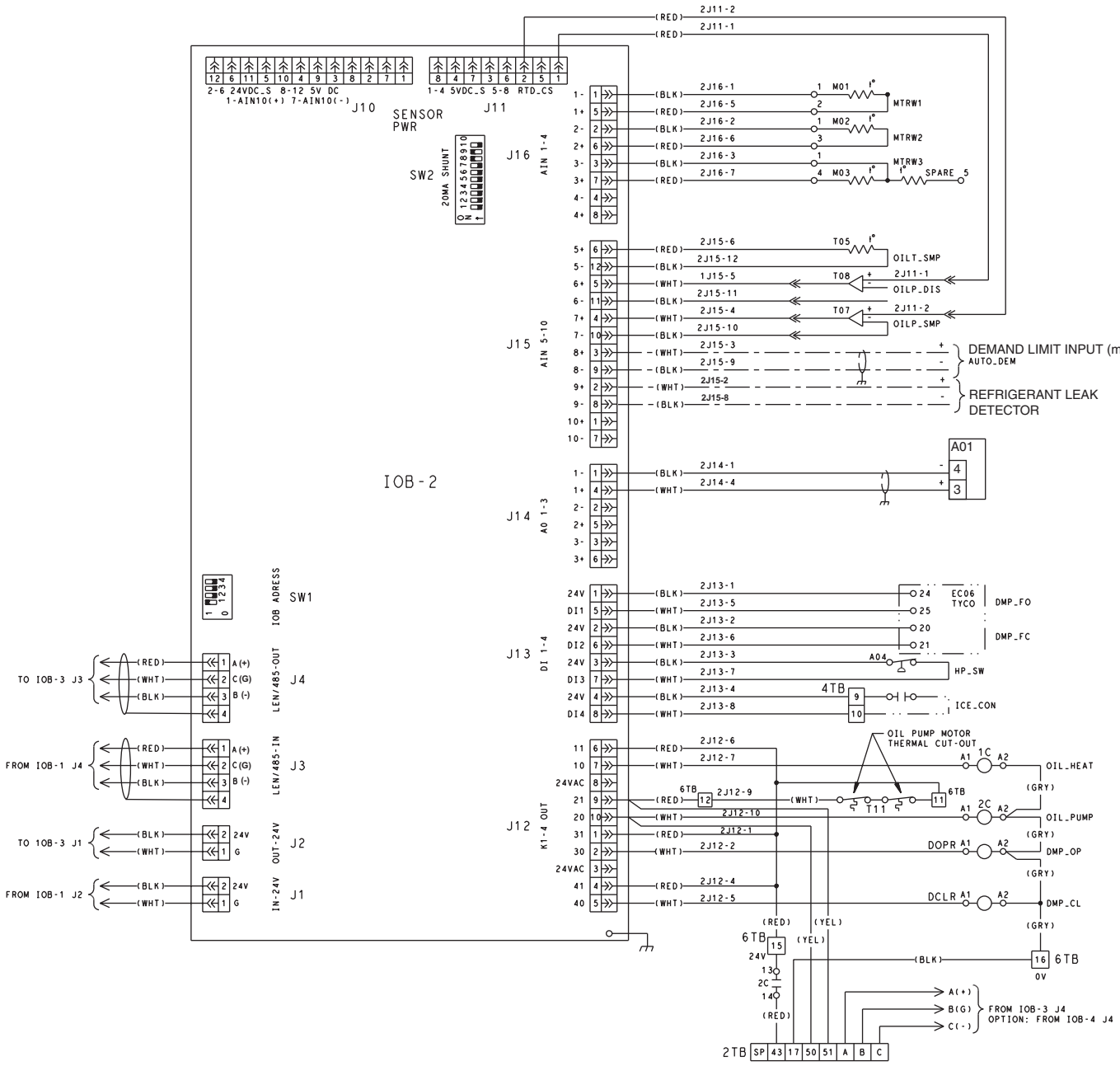

IOB-2
J10
J11
J12
J13
J14
J15
J16
J1
J2
J3
J4
SW1
SW2
SENSOR PWR
2-6 24VDC_S 8-12 5V DC
1-AIN10(+) 7-AIN10(-)
1-4 5VDC_S 5-8 RTD_CS
IOB ADRESS
20MA SHUNT
AIN 1-4
AIN 5-10
AO 1-3
DI 1-4
K1-4 OUT
IN-24V
OUT-24V
LEN/485-IN
LEN/485-OUT
MTRW1
MTRW2
MTRW3
SPARE_5
OILT_SMP
OILP_DIS
OILP_SMP
DEMAND LIMIT INPUT (mA)
AUTO_DEM
REFRIGERANT LEAK DETECTOR
DMP_FO
DMP_FC
HP_SW
ICE_CON
OIL PUMP MOTOR THERMAL CUT-OUT
OIL_HEAT
OIL_PUMP
DMP_OP
DMP_CL
FROM IOB-3 J4
OPTION: FROM IOB-4 J4
TO IOB-3 J3
FROM IOB-1 J4
TO IOB-3 J1
FROM IOB-1 J2
2TB
6TB
4TB

Fig. 7 — IOB 2

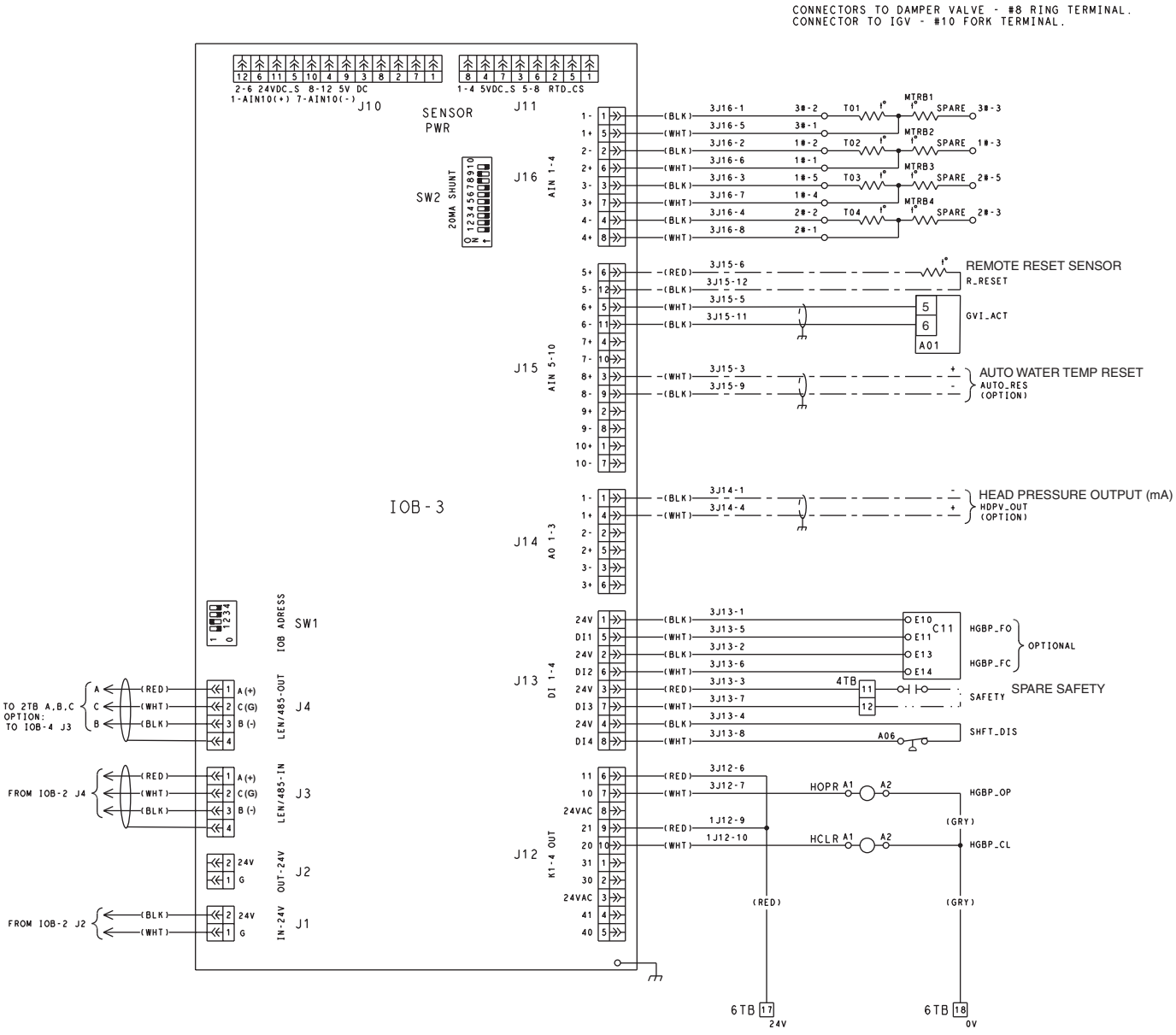

CONNECTORS TO DAMPER VALVE - #8 RING TERMINAL.
CONNECTOR TO IGV - #10 FORK TERMINAL.
IOB-3
J10
2-6 24VDC_S 8-12 5V DC
1-AIN10(+) 7-AIN10(-)
J11
1-4 5VDC_S 5-8 RTD_CS
SENSOR PWR
SW2
20MA SHUNT
J16
AIN 1-4
MTRB1
MTRB2
MTRB3
MTRB4
SPARE
REMOTE RESET SENSOR
R_RESET
GVI_ACT
A01
J15
AIN 5-10
AUTO WATER TEMP RESET
AUTO_RES
(OPTION)
HEAD PRESSURE OUTPUT (mA)
HDPV_OUT
(OPTION)
J14
AO 1-3
SW1
IOB ADRESS
J13
DI 1-4
C11
HGBP_FO
HGBP_FC
OPTIONAL
4TB
SAFETY
SPARE SAFETY
A06
SHFT_DIS
J12
K1-4 OUT
HOPR
HCLR
HGBP_OP
HGBP_CL
6TB 17
24V
6TB 18
0V
TO 2TB A,B,C
OPTION:
TO IOB-4 J3
J4
LEN/485-OUT
FROM IOB-2 J4
J3
LEN/485-IN
J2
OUT-24V
FROM IOB-2 J2
J1
IN-24V

Fig. 8 — IOB 3

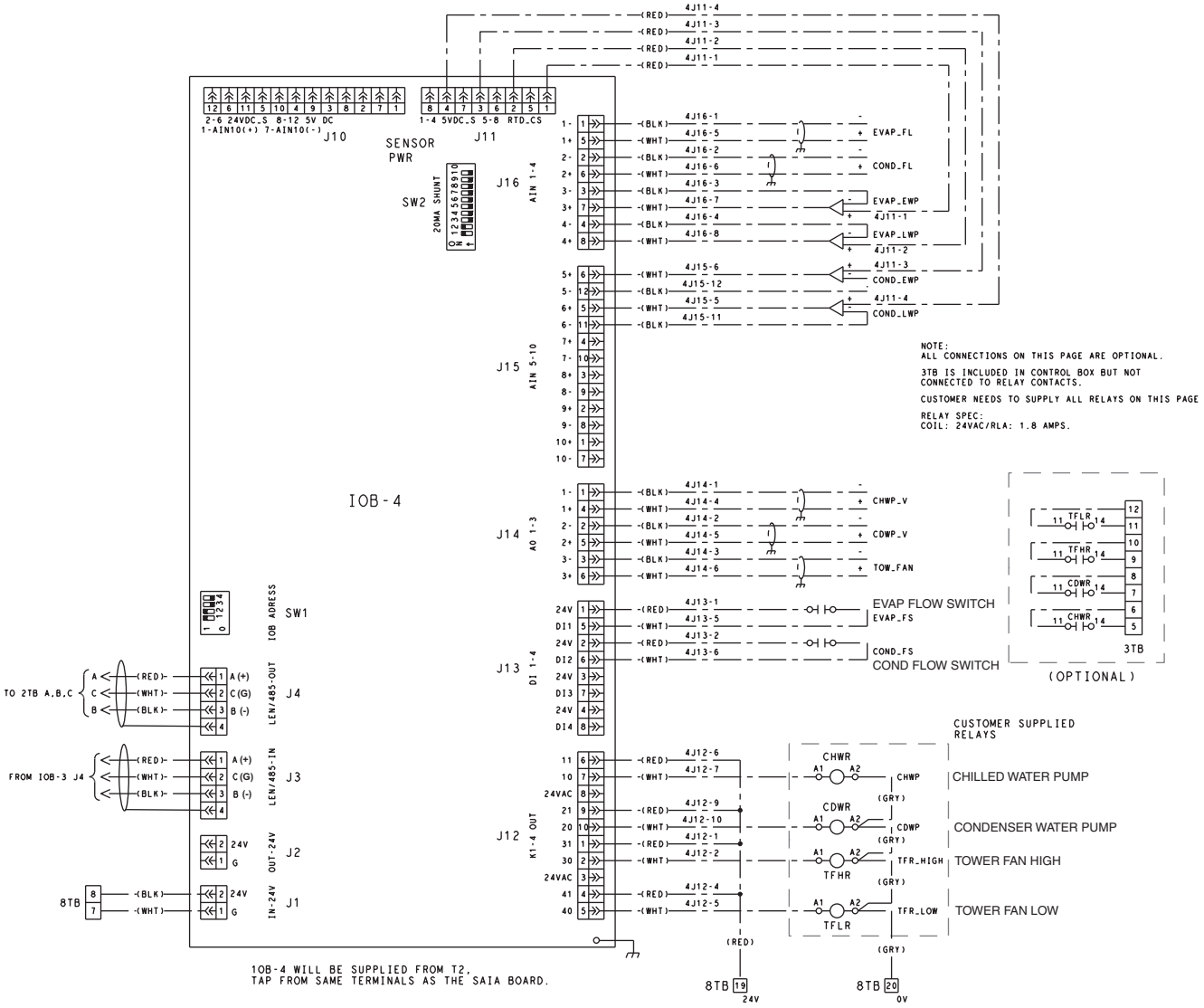

IOB-4
J10
J11
J16
J15
J14
J13
J12
J4
J3
J2
J1
SW1
SW2
SENSOR PWR
2-6 24VDC_S 8-12 5V DC
1-AIN10(+) 7-AIN10(-)
1-4 5VDC_S 5-8 RTD_CS
20MA SHUNT
IOB ADRESS
LEN/485-OUT
LEN/485-IN
OUT-24V
IN-24V
AIN 1-4
AIN 5-10
AO 1-3
DI 1-4
K1-4 OUT
4J11-4 (RED)
4J11-3 (RED)
4J11-2 (RED)
4J11-1 (RED)
4J16-1 (BLK) EVAP_FL
4J16-5 (WHT)
4J16-2 (BLK) COND_FL
4J16-6 (WHT)
4J16-3 (BLK) EVAP_EWP
4J16-7 (WHT)
4J16-4 (BLK) EVAP_LWP
4J16-8 (WHT)
4J15-6 (WHT) COND_EWP
4J15-12 (BLK)
4J15-5 (WHT) COND_LWP
4J15-11 (BLK)
4J14-1 (BLK) CHWP_V
4J14-4 (WHT)
4J14-2 (BLK) CDWP_V
4J14-5 (WHT)
4J14-3 (BLK) TOW_FAN
4J14-6 (WHT)
4J13-1 (RED) EVAP_FS
4J13-5 (WHT) EVAP FLOW SWITCH
4J13-2 (RED) COND_FS
4J13-6 (WHT) COND FLOW SWITCH
4J12-6 (RED) CHWR CHWP (GRY) CHILLED WATER PUMP
4J12-7 (WHT)
4J12-9 (RED) CDWR CDWP (GRY) CONDENSER WATER PUMP
4J12-10 (WHT)
4J12-1 (RED) TFHR TFR_HIGH (GRY) TOWER FAN HIGH
4J12-2 (WHT)
4J12-4 (RED) TFLR TFR_LOW (GRY) TOWER FAN LOW
4J12-5 (WHT)
CUSTOMER SUPPLIED RELAYS
NOTE:
ALL CONNECTIONS ON THIS PAGE ARE OPTIONAL.
3TB IS INCLUDED IN CONTROL BOX BUT NOT CONNECTED TO RELAY CONTACTS.
CUSTOMER NEEDS TO SUPPLY ALL RELAYS ON THIS PAGE
RELAY SPEC:
COIL: 24VAC/RLA: 1.8 AMPS.
3TB
(OPTIONAL)
TO 2TB A,B,C
FROM IOB-3 J4
8TB
8TB 19 24V
8TB 20 0V
IOB-4 WILL BE SUPPLIED FROM T2,
TAP FROM SAME TERMINALS AS THE SAIA BOARD.

Fig. 9 — IOB 4

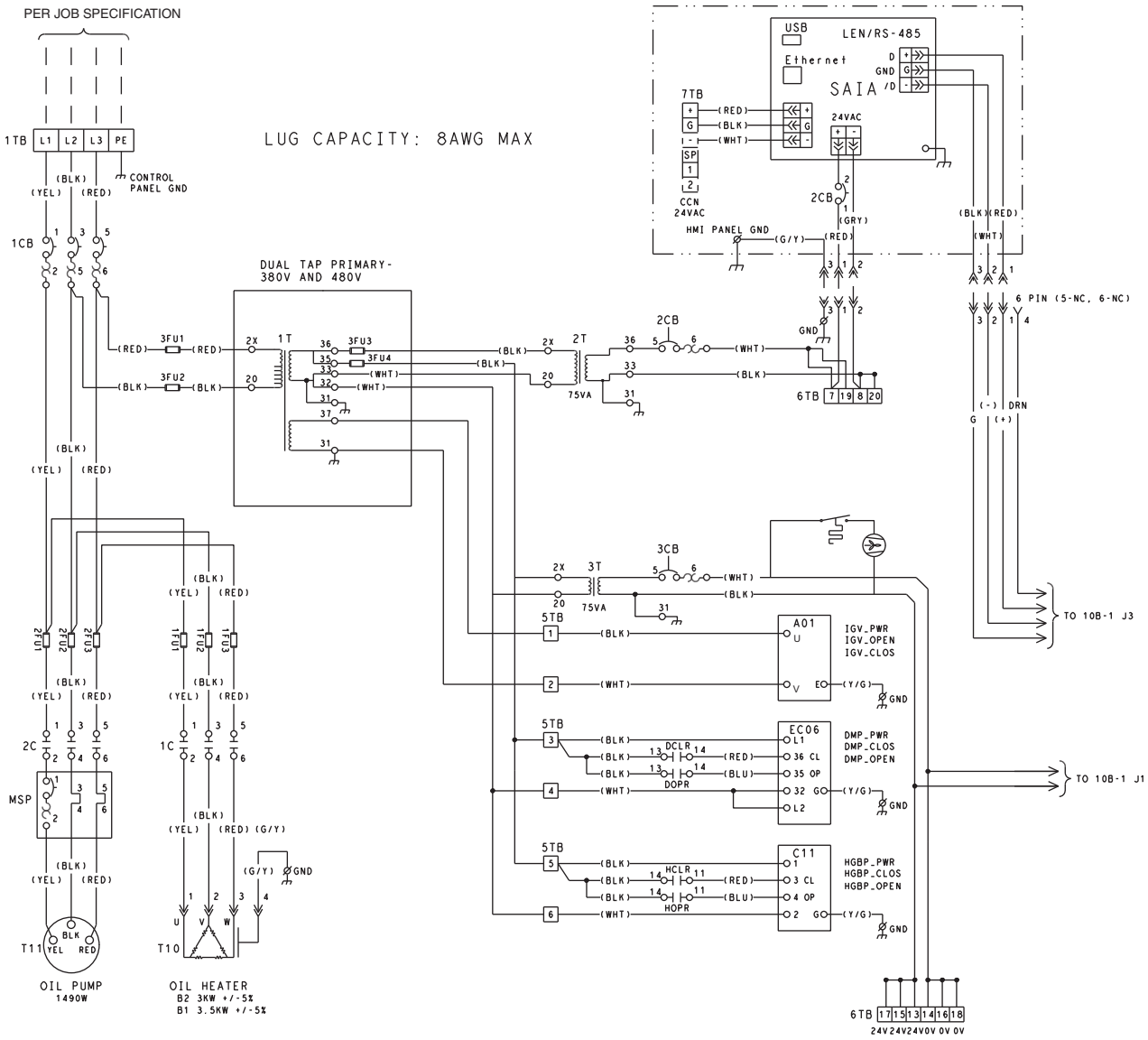


Fig. 10 — Control Wiring

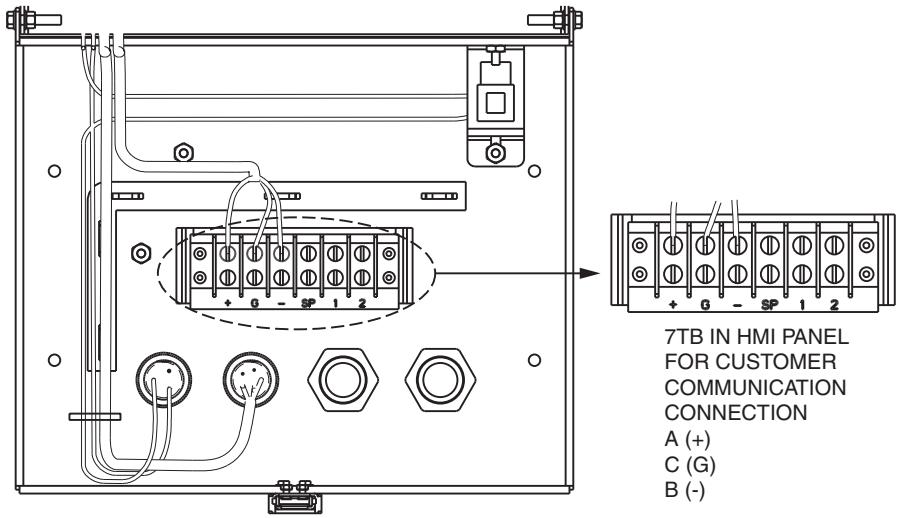


Fig. 11 — HMI Panel

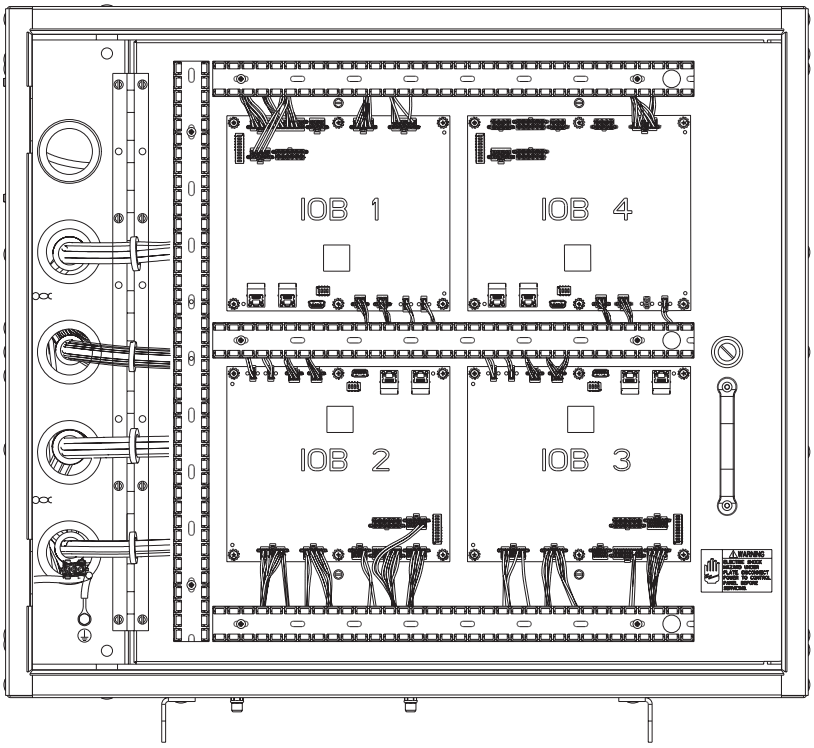
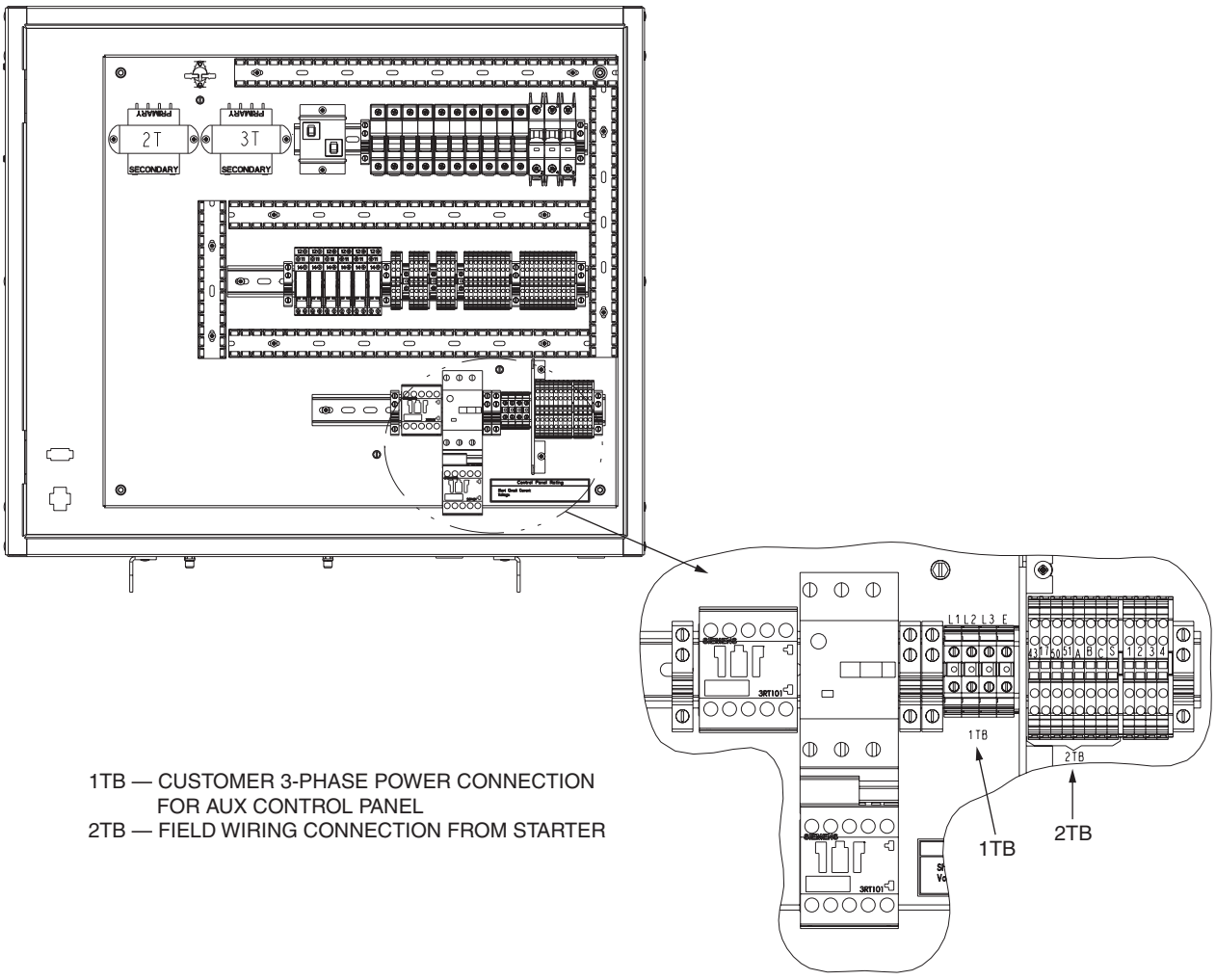


Fig. 12 — Auxiliary Control Panel, IOB Layer



1TB — CUSTOMER 3-PHASE POWER CONNECTION
FOR AUX CONTROL PANEL
2TB — FIELD WIRING CONNECTION FROM STARTER

Fig. 13 — Auxiliary Control Panel, Bottom Layer

Sensors

PRESSURE TRANSDUCERS — Pressure transducers measure and control the pressures in the unit. These electronic sensors deliver 0 to 5 VDC. The transducers can be calibrated through the controller. The pressure transducers are connected to the IOBs. See Table 6.

Table 6 — Pressure Transducers

PRESSURE TRANSDUCER	PURPOSE
Evaporator	Measures evaporator pressure
Condenser	Measures condenser pressure
Economizer	Measures economizer pressure
Oil Supply	Measures oil pressure in the oil discharge piping
Oil Sump	Measures oil pressure in the oil sump
Evaporator Entering Water	(Optional) Measures pressure of evaporator entering water
Evaporator Leaving Water	(Optional) Measures pressure of evaporator leaving water
Condenser Entering Water	(Optional) Measures pressure of condenser entering water
Condenser Leaving Water	(Optional) Measures pressure of condenser leaving water

TEMPERATURE SENSORS — The system uses electronic sensors to measure and control the temperatures in the unit. There are three types of temperature sensors: 5K thermistor, 10K thermistor, and RTD (resistance temperature detector, 100 Ω, 3-wire) based on IOB channel configurations. The temperature sensor range is –40 F (–40 C) to 245 F (118 C). See Table 7.

Table 7 — Temperature Sensors

TEMPERATURE SENSOR	PURPOSE
Entering Chilled Water	Measures entering evaporator water temperature
Leaving Chilled Water	Measures leaving evaporator water temperature
Entering Condenser Water	Measures entering condenser water temperature
Leaving Condenser Water	Measures leaving condenser water temperature
Evaporator Refrigerant Liquid	Measures evaporator refrigerant liquid temperature
Compressor Discharge	Measures compressor discharge temperature
Low Speed Motor End Bearing	Measures temperature of the low speed motor end bearing temperature
Low Speed Compressor End Bearing	Measures temperature of the low speed compressor end bearing temperature
High Speed Motor End Bearing	Measures temperature of the high speed motor end bearing temperature
High Speed Compressor End Bearing	Measures temperature of the high speed compressor end bearing temperature
Motor Winding End	Three sensors measure the temperature of each phase of the compressor motor
Oil Sump	Measures the compressor sump oil temperature
Oil Supply	Measures the oil temperature in the oil discharge piping

Controls Outputs

EVAPORATOR/CONDENSER WATER PUMP — The controller can regulate an optional evaporator/condenser water pump.

INLET GUIDE VANE — The inlet guide vane adjusts the refrigerant vapor flow into the compressor to adapt to change in the operating conditions of the machine. To adjust the refrigerant flow, the guide vane opens or closes to vary the cross-section of the refrigerant path. The high degree of accuracy with which the guide vane is positioned ensures that the flow of refrigerant is precisely controlled.

ECONOMIZER DAMPER VALVE — The economizer damper control opens or closes the economizer damper valve to maintain a minimum refrigerant pressure difference between the evaporator and economizer.

HGBP VALVE — The hot gas bypass function artificially loads the chiller and keeps it running under low load conditions or helps to prevent surge conditions. Since this function can also reduce the operating efficiency of the machine, this is a user-selectable and configurable option.

VFD — The VFD modifies motor frequency to allow compressor start-up and capacity control. The VFD controls continually monitor parameters in order to ensure compressor protection. Should a problem occur, the controller triggers an alarm and the compressor is stopped if necessary.

PIC 5 USER INTERFACE

The PIC 5 Human Machine Interface (HMI) is a color 10.4 in. TFT touch screen. Navigation is either direct from the touch screen interface or by connecting to a web interface at the Ethernet IP port of the controller. The navigation menus are the same for both connection methods.

Web Connection — Two web connections may be authorized at the same time. When two users are connected simultaneously, there is no priority between users; that is, the last modification is in effect regardless of the user.

Connection is from a personal computer using a Java-enabled web browser. See the section Touch Screen Settings for the Controller on page 52 for configuration instructions. The minimum browser configuration includes:

- Microsoft Internet Explorer (version 8 or higher) or Mozilla Firefox (version 3.5.2 or higher). In the advanced connection options, add the unit address to the address list. Do not use a proxy server.
- Java platform (version 6 or higher). In the control panel, deselect (uncheck) the option that allows storing temporary internet files and use a direct connection.

To access the PIC 5 user interface, enter the IP address of the unit in the address bar of the web browser. The IP address can be viewed or changed from the PIC 5 interface. For more information on the web browser and Java platform configuration, see the Diagnostics and Troubleshooting section on page 30 and contact your network administrator.

General Interface Features

ICONS — Table 8 shows general interface icons.

Table 8 — Interface Icons

ICON	MEANING
	Green: Indicates unit is running Gray: Indicates unit is off
	Home
	Main menu
	Indicates user is logged off
	Indicates user is logged in
	Gray: Indicates no alarm or alert is active Red: Indicates alarm or alert
	Back (not visible in main menu)
1/2	Previous and next screen
	HMI (Human Machine Interface) settings (visible only when a communication failure occurs)
	More information
Click this icon	Value that can be modified

SCREENS — The Human Machine Interface includes the following screens:

- Welcome screen
- Home screen, which displays the main parameters
- Menu screens for navigation
- Data/configuration screens, which list the parameters by type
- Operating mode selection screen
- Password entry and language selection screen
- Parameter modification screen
- Time schedule screen

If the interface is not used for a long period, it goes into screen-saver mode and displays a black screen. However, the control is always active and the unit operating mode remains unchanged. When the user presses the black screen, the Welcome screen is displayed.

Welcome Screen —The Welcome screen (see Fig. 14) is displayed when the unit is switched on or when the user presses the screen when the interface has gone into screen-saver mode. The Welcome screen displays the current software version number. To exit from this screen, press the Home icon .

Fig. 14 — Welcome Screen

System Overview (Home) Screen — Figure 15 shows the system overview screen. Press a component image to see current status. For details, see Status Display Screens on page 20.

LEGEND

1	—	Home Screen Access Button
2	—	Main Menu Access Button
3	—	User Login Screen Access Button
4	—	Unit Start/Stop Access Button
5	—	Alarm Menu Access Button
6	—	Condenser Saturated Temperature and Pressure
7	—	Evaporator Saturated Temperature and Pressure
8	—	Guide Vane Position Percentage
9	—	Unit Capacity Percentage (Motor Load Current Percentage)
10	—	Set Point
11	—	Evaporator Pump Status (Hydraulic System Option is Enabled)
12	—	Evaporator Water Inlet and Outlet Temperature
13	—	Oil Pressure Delta
14	—	Oil Temperature
15	—	Condenser Pump Status (Hydraulic System Option is Enabled)
16	—	Condenser Inlet and Outlet Temperature

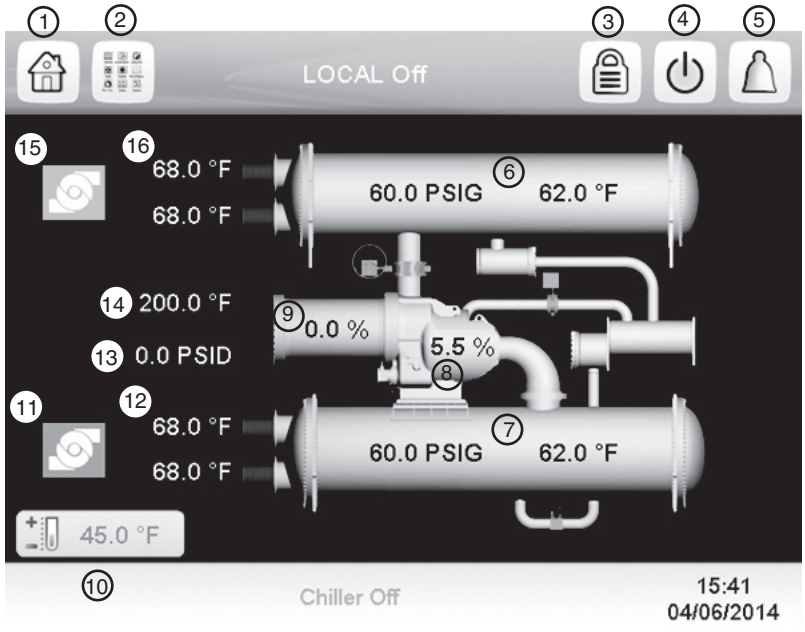


Fig. 15 — System Overview (Home) Screen

Messages — The Set Point screen, On/Off screen, User Login screen, and Main Menu screens described in the next sections may display status messages at the bottom of the screen. See Table 9.

Table 9 — Status Messages

MESSAGE	STATUS
COMMUNICATION FAILURE!	Equipment controller did not respond while reading the table content.
ACCESS DENIED!	Equipment controller does not allow access to one of the table data blocks.
LIMIT EXCEEDED!	The value entered exceeds the table limits.
Save changes?	Modifications have been made. The interface waits to confirm exit; press Save or Cancel.
HIGHER FORCE IN EFFECT!	Equipment controller rejected a Force or Auto command because the interface force level is lower than that of the equipment controller.

Set Point Screen — The Set Point screen displays the current set point table. See Fig. 16. For more information about these settings, see the Set Point section on page 22.

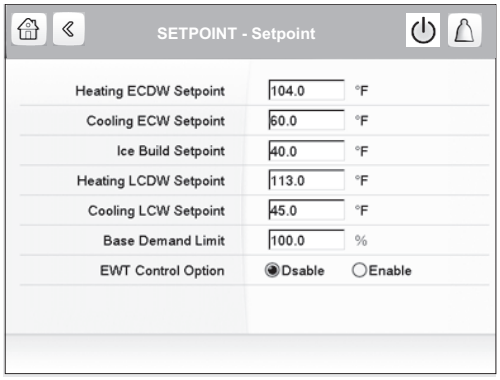


Fig. 16 — Set Point Screen

Unit Start/Stop Screen — The Unit Start/Stop screen allows the user to select the unit operating mode.

For unit start-up, with the unit in Local Off mode, press the gray Off icon to display the list of operating modes. Select the required mode to start up the chiller. See Fig. 17.

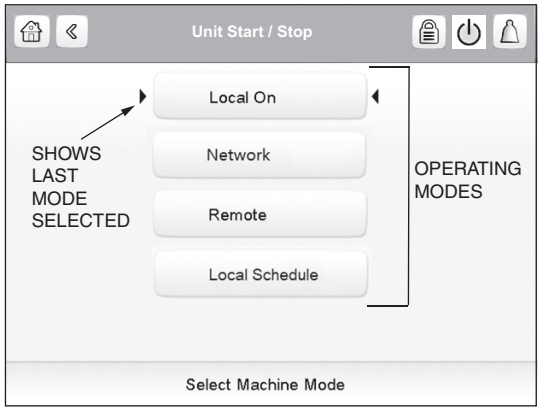


Fig. 17 — Unit Start/Stop Screen

When a start-up mode is selected, a status screen displays the progress of the start-up sequence (Fig. 18).

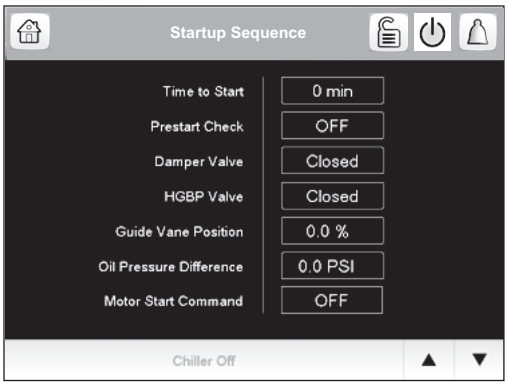


Fig. 18 — Start-Up Sequence Progress

To stop the unit, press the green On icon . Then press Confirm Stop to stop the unit, or press the Back icon to cancel the stop and return to the previous screen. See Fig. 19.

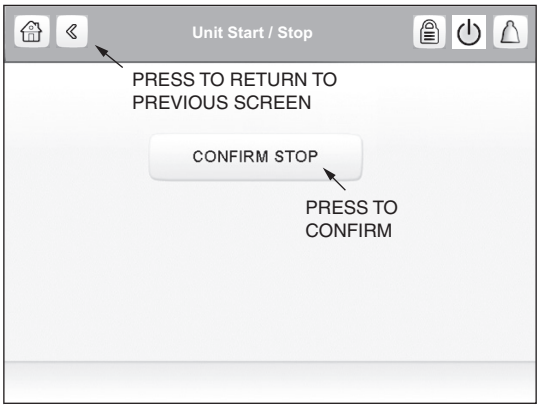
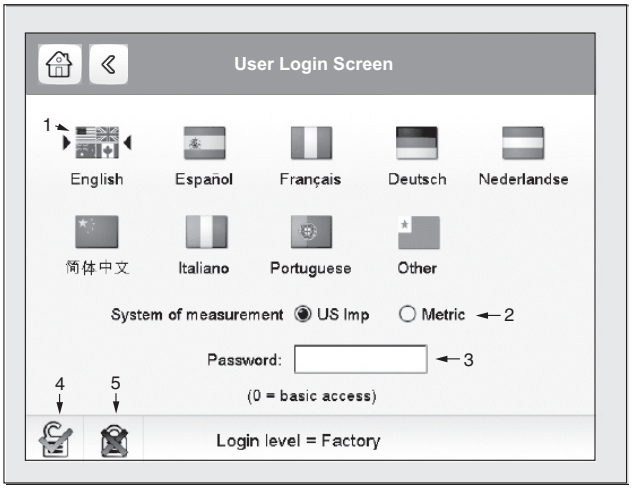


Fig. 19 — Confirm Stop

User Login Screen — Use this screen to login or log off and to set interface language and measurement system. See Fig. 20. There are three levels of password access:

- Basic access allows the user to view all data without a password.
- User access gives the user the additional ability to view and change many configuration settings, including setpoints and schedules. The default User password is 1111.
- Service access allows the user to test and change maintenance settings. The default Service (Advanced User) password is 2222.
- Factory access allows intial unit profiling at the factory. The default factory password is 4444.



LEGEND

1 — Arrows indicate active language

2 — Measurement system (Metric or US Imperial)

3 — Enter password

4 — Login

5 — Log off

Fig. 20 — User Login Screen

Main Menu Screen — To access the Main Menu screen, press the Main Menu icon . Press the icons on the screen to access the appropriate table or menu. Press the arrows at the bottom right corner, if present, to navigate through pages of tables. The options shown on the Main Menu screen depend on the user's level of access (see the section "User Login Screen"). Figure 21 shows the Main Menu screen as it appears for the User level of access.

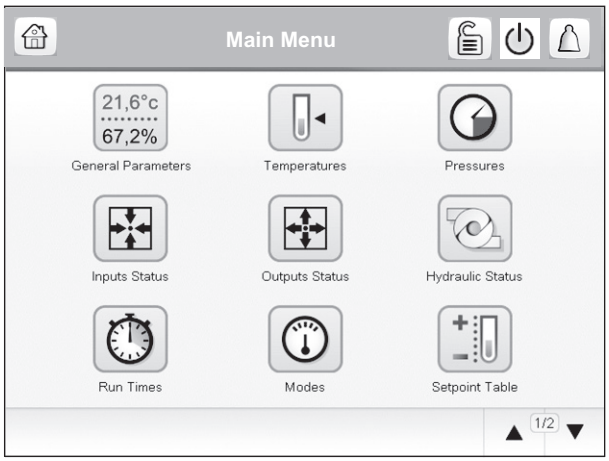


Fig. 21 — Main Menu Screen (Basic Access)

Configuration Screen — To access the Configuration menu, press the Configuration icon on page 2 of the Main Menu (User, Service, or Factory access level). The Configuration menu opens. Then press the General Configuration icon on the Configuration menu. Press the arrows at the bottom right corner to navigate through pages. See Fig. 22. (Certain configuration settings are available only for Service or Factory access levels.) Refer to Appendix A, page 67 for more information about Configuration options.

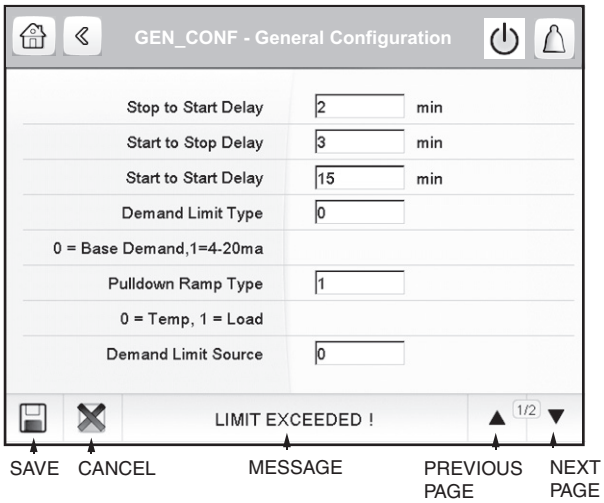
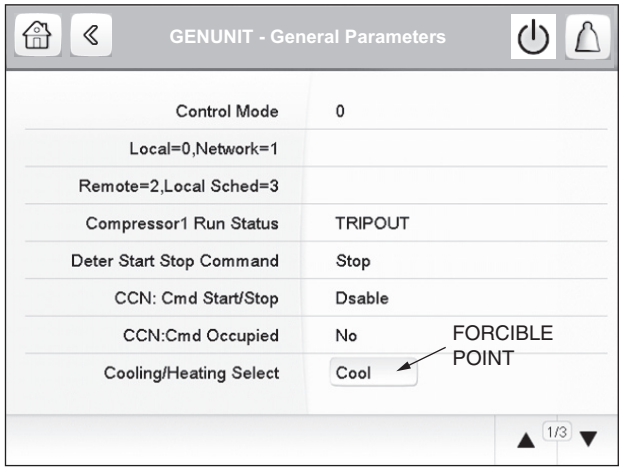


Fig. 22 — General Configuration Screen

To force a point, press the forcible point on the screen. Figure 23 shows an example.



NOTE: Special pressure vessels are required for Heating mode (future option). Do not select Heating mode unless this option has been purchased.

Fig. 23 — Forcible Point

The Force Variable screen opens, where you can select the forced value. (Press the the Auto icon to cancel a forced point.) See Fig. 24.

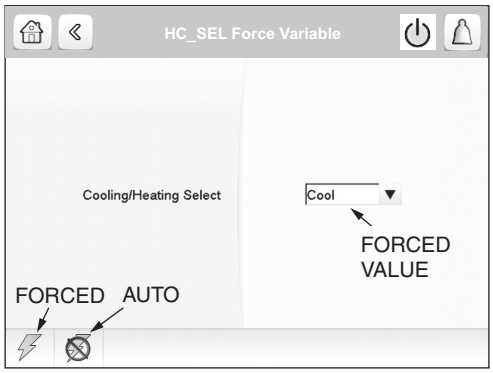


Fig. 24 — Forced Variable Screen

Schedule Menu Screen — To access the Schedule menu screen, press on the Configuration menu screen. Press the arrows at the bottom right corner to navigate through the time periods. See Fig. 25.

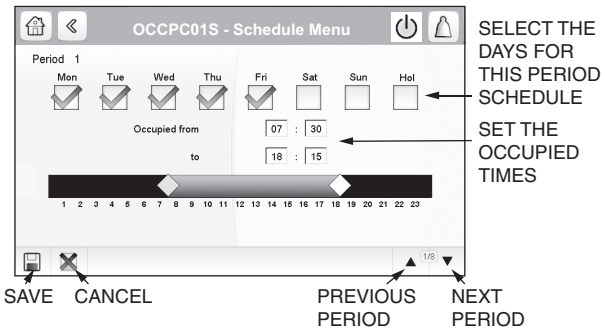


Fig. 25 — Schedule Menu Screen

Status Display Screens — Figure 26 shows the system status overview (home) screen. Press any component on the screen to see the status of that component. Press the arrows at the bottom right corner to navigate through the component status displays. Figures 27-33 show the component status displays.

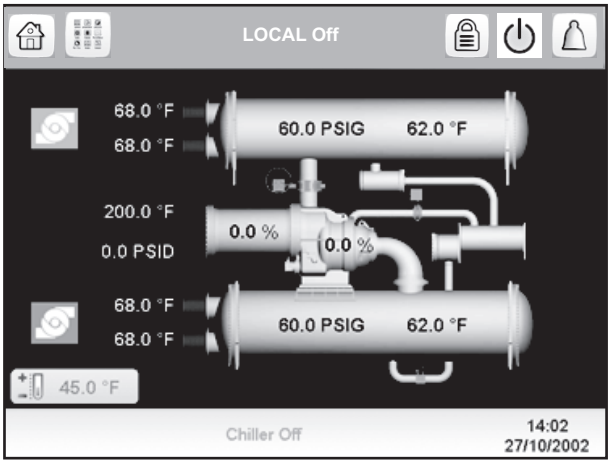


Fig. 26 — System Overview (Home) Screen

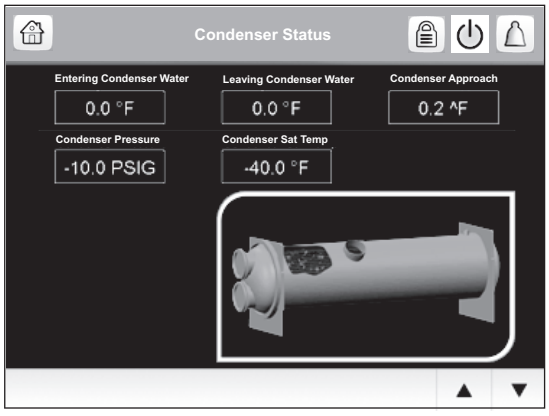


Fig. 27 — Condenser Status

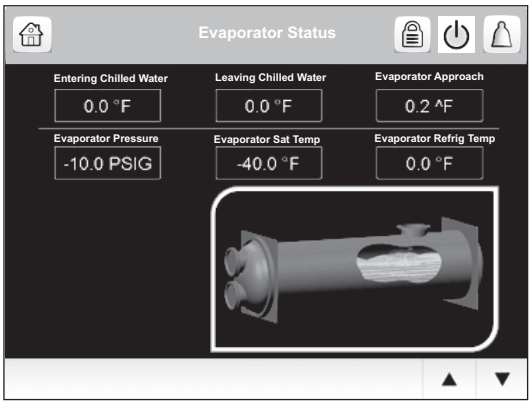


Fig. 28 — Evaporator Status

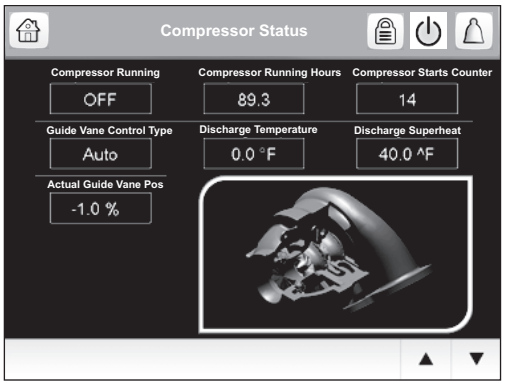


Fig. 29 — Compressor Status

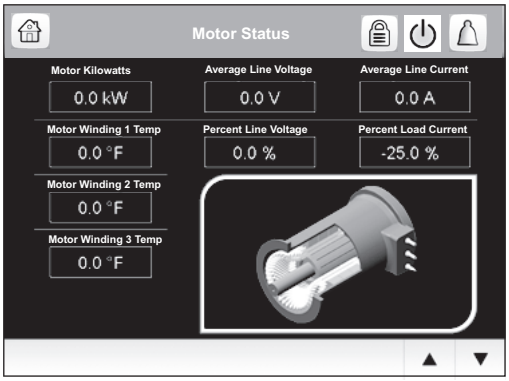
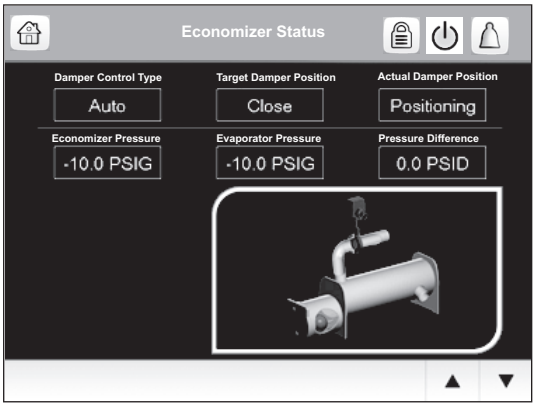


Fig. 30 — Motor Status



NOTE: The pressure difference shown in this screen is the difference between the economizer pressure and the evaporator pressure.

Fig. 31 — Economizer Status

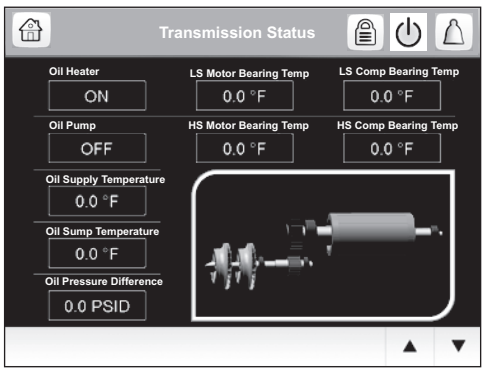


Fig. 32 — Transmission Status

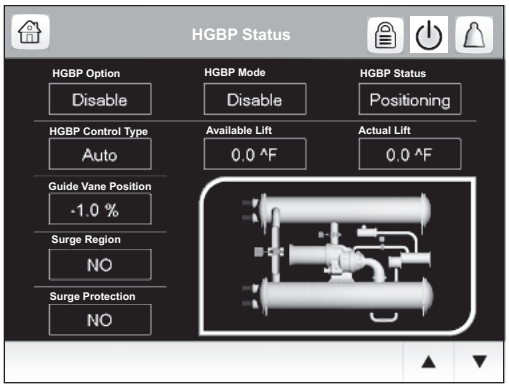


Fig. 33 — HGBP (Hot Gas Bypass) Status

PIC 5 CONTROL OPERATION

Start-Stop Control — This function controls the chiller START-STOP command. There are four selectable control modes: LOCAL, LOCAL SCHEDULE, REMOTE, or NETWORK. See Unit Start/Stop Screen on page 18. Specific control sources are valid to start or stop the chiller for each control mode.

LOCAL — When the control mode is LOCAL, the chiller can be started by the "Local ON" button on the PIC 5 interface screen, and can be shut down by the Confirm Stop button on the screen or by the EMSTOP software point.

LOCAL SCHEDULE — When the control mode is LOCAL SCHEDULE, the chiller will be started automatically if the configurable local schedule is Occupied. The chiller can be shut down by the unoccupied schedule, the Stop button on the PIC 5 interface screen, or by the EMSTOP software point.

REMOTE — When the control mode is REMOTE, the chiller will be started by the remote discrete input (REM_CON) located on the I/O board. The chiller can be shut down by the remote discrete input, the Stop button on the PIC 5 interface screen, or by the EMSTOP software point.

NETWORK — When the control mode is NETWORK, the chiller can be started and stopped by the CHIL_S_S and CHIL_OCC software points, which are written by other equipment through network commands and network schedule. The chiller can also be shut down by the EMSTOP software point.

NOTE: There is a STOP OVERRIDE point in the GENUNIT table. If this point is enabled the chiller cannot be started and will shut down the chiller if it is running.

Compressor Run Status — Compressor run status is shown at the top of the system overview (home) screen. Table 10 lists the chiller status numbers, names, and descriptions.

Table 10 — Compressor Run Status

STATUS NO.	STATUS NAME	DESCRIPTION
0	OFF	STATSTOP is STOP, no alarm
1	CTLTEST	Controls Test is active
2	PUMPDOWN	Pumpdown in Controls Test is active
3	LOCKOUT	Lockout in Controls Test is active.
4	RECYCLE	Recycle shutdown completed on low load in effect until the need for cooling resumes; non-fault condition
5	TRIPOUT	Shutdown completed due to alarm fault condition
6	TIMEOUT	The controls are delaying the start sequence until the Start to Start or Stop to Start timers have elapsed
7	PRESTART	The chiller is in the process of system checking before energizing the compressor motor
8	STARTUP	Normal startup in progress
9	AUTORST	Auto Rapid Start in progress
10	RAMPING	Ramp loading in progress. The chiller has started and is gradually increasing its load to control electrical demand charges.
11	RUNNING	The chiller has completed ramp loading following start up. Normal running mode, no override and not in demand.
12	OVERRIDE	Running with Override active
13	DEMAND	Running with Demand Limit active. The chiller is prevented from loading further because it has reached an AVERAGE LINE CURRENT limit or a MOTOR KILOWATTS limit.
14	SHUTDOWN	Compressor shutdown in progress

Chiller Start-Up Sequence

PRE-START CHECK — Once start-up begins, the controller performs a series of pre-start tests to verify that all pre-start alerts and safeties are within limits. Progress is shown on the Startup Sequence screen (see Fig. 34). Table 11 lists pre-start alert and alarm conditions.

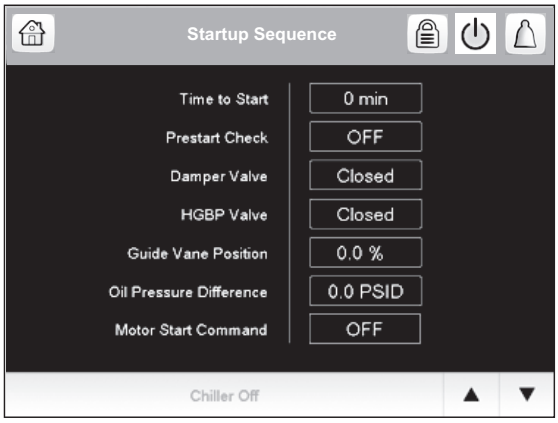


Fig. 34 — Start-Up Sequence Screen

Table 11 — Pre-Start Alerts and Alarms

PRE-START ALERT CONDITION	STATE NO.	ALARM OR ALERT
STARTS IN 12 HOURS >= 8	100	Alert
OIL SUMP TEMP <= 140 F (60 C) AND OIL SUMP TEMP <= EVAP_SAT + 50 F (27.8 C)	101	Alert
CONDENSER PRESSURE >= COND PRESS OVERRIDE – 20 psi	102	Alert
Number of recycle restart in the last 4 hours is greater than 5	103	Alert
COMP BEARING TEMP >= COMP BEARING ALERT– 10 F (5.5 C)	230	Alarm
COMP MOTOR WINDING TEMP >= MOTOR TEMP OVERRIDE – 10 F (5.5 C)	231	Alarm
COMP DISCHARGE TEMP >= COMP DISCHARGE ALERT– 10 F (5.5 C)	232	Alarm
EVAP_SAT < Evap trip point* + EVAP OVERRIDE DELTA T or EVAP REFRIG LIQUID TEMP < Evap trip point* + EVAP OVERRIDE DELTA T	233	Alarm
AVERAGE LINE VOLTAGE <= UNDERVOLTAGE THRESHOLD	234	Alarm
AVERAGE LINE VOLTAGE >= OVERVOLTAGE THRESHOLD	235	Alarm
Guide vane 1 has not been calibrated successfully	236	Alarm

*Evap trip point = 33 F (0.6 C) (water) or EVAP REFRIG TRIPPOINT (brine).

The compressor RUN STATUS parameter on the default screen line now reads PRESTART. If a test is not successful, the start-up is delayed or aborted. If the tests are successful, the chilled water pump relay energizes, and the main screen line now reads STARTUP.

START-UP — One second after the successful pre-start check, the chilled water and condenser water pump relays are energized.

Five seconds later, the control monitors the chilled water and condenser water flow devices and waits until the WATER FLOW VERIFY TIME (service-configured, default 5 minutes) expires to confirm water flow.

After water flow is verified, the water temperature is compared to CONTROL POINT + $^1/_2$ CHILLED WATER DEADBAND. If the temperature is less than or equal to this value, the control turns off the condenser pump relay and goes into RECYCLE mode.

If the RECYCLE condition does not exist, the start-up sequence continues and checks the guide vane position. For a single-stage compressor (Comp [Single = 0, Dual = 1] = 0 in FACTORY configuration), if the guide vanes are more than 4% open, the start-up waits until the controller closes the vanes. For a dual-stage compressor (Comp [Single = 0, Dual = 1] = 1 in FACTORY configuration), the guide vanes are opened to the initial position specified with GV1 Closure at Startup in the Option Configuration menu.

If an HGBP or economizer damper valve is equipped and enabled, the control checks that the position of these valves is fully closed.

If the vanes and valves position are verified and the oil pump pressure is less than 4 psi (27.6 kPa), the oil pump relay is energized.

The control then waits until the oil pressure (OIL PRESS VERIFY TIME, operator-configured, default 40 seconds) reaches a maximum of 18 psi (124 kPa). After oil pressure is verified, the control waits 40 seconds for oil prelube, and the compressor start relay energizes to start the compressor.

Chiller Shutdown Sequence — Chiller shutdown begins if any of the following occurs:

- Local OFF button is pressed
- A recycle condition is present (see the previous section)
- The time schedule has gone into unoccupied mode
- The chiller protective limit has been reached and chiller is in alarm
- The start/stop status (CHIL_S_S) is overridden to stop from the network

If the chiller is normally shut down from running, a soft-stop shutdown will be performed. The soft-stop feature closes the guide vanes of the compressor automatically if a non-alarm stop signal occurs before the compressor motor is deenergized.

Any time the compressor is directed to STOP (except in the cases of a fault shutdown), the guide vanes are directed to close and VFD will be commanded to minimum speed for a variable speed compressor. The compressor shuts off when any of the following is true:

- AVERAGE LINE CURRENT (%) drops below the SOFT STOP AMPS THRESHOLD
- ACTUAL GUIDE VANE POSITION drops below 4%
- Four minutes have elapsed since the stop was initialized

When any of these conditions is true, the shutdown sequence stops the compressor by deactivating the compressor start relay. The guide vanes are then commanded to the fully closed position. The oil pump relay will be turned off after 60 seconds post-lube.

Finally, the chilled water/brine pump and condenser water pump are shut down.

Oil Lubrication Control — As part of the pre-start checks executed by the controls, the oil sump temp is compared to the evaporator saturated refrigerant temperature. If the oil temperature is less than 140 F (60 C) and less than evaporator saturated refrigerant temperature plus 50° F (27.8° C), the start-up will be delayed until either of these conditions is no longer true. Once this temperature is confirmed, the start-up continues.

The oil heater relay is energized whenever the chiller compressor is off and the oil sump temperature is less than 140 F (60 C) or the oil sump temperature is less than the evaporator saturated refrigerant temperature plus 53° F (29.4° C). The oil heater is turned off when either of the following conditions is true:

- Oil sump temperature is more than 152 F (66.7 C)
- Oil sump temperature is more than 144° F (62.2 C) and more than the evaporator saturated refrigerant temperature plus 55° F (30.6° C).

The oil heater is always off when the compressor is running.

The oil pump is also energized for 30 seconds after each 30 minutes of the oil heat relay being energized in order to stir the oil for more evenly distributed heating.

Control Points

SET POINT — The set point can be configured at the Setpoint menu (“USER” access level).

The set point is determined by the heat/cool mode, EWT

Table 12 — Set Point Determination

EWT CONTROL OPTION	HEAT/COOL MODE	
	COOLING	HEATING
Disabled	Cooling LCW Set Point	Heating LCDW Set Point
Enabled	Cooling ECW Set Point	Heating ECDW Set Point

NOTES:
1. The ice build option is disabled when heat/cool mode is set to Heating.
2. When the ice build option is enabled and ice build is active, the control point is the Ice Build Set Point and the controlled water temperature is the leaving chilled water temperature.

CONTROL POINT TEMPERATURE — Capacity control is based on achieving and maintaining a control point temperature, which is the sum of a valid set point (from the SETPOINT screen) and a temperature reset value. In Cooling mode, the control point temperature is equal to the set point plus temperature reset. In Heating mode, the control point temperature is equal to the set point minus temperature reset.

The control point can be viewed directly on the main screen or the General Parameters menu.

TEMPERATURE RESET — Three types of chilled water or brine reset are available and can be viewed or modified on the Reset Configuration screen.

The default screen indicates when the chilled water reset is active. The control point Reset on the General Parameters screen indicates the amount of reset.

To activate a reset type, access the Reset Configuration (RESETCFG) screen and input all configuration information for that reset type.

Reset Type 1: 4 to 20 mA Temperature Reset — Reset Type 1 is an automatic reset utilizing a 4 to 20 mA analog input signal provided from any external sensor, controller, or other device which is appropriately configured. For this type, Degrees Reset At 20 mA is configured in the RESETCFG table.

Reset Type 2: Remote Temperature Reset — Reset Type 2 is an automatic water temperature reset based on a remote temperature sensor input signal. This function can be accessed by setting the following configurations:

1. Configure the remote temperature at which no reset occurs (Remote temp → NO RESET).
2. Configure the remote temperature at which full reset occurs (Remote temp → FULL RESET).
3. Enter the amount of reset (Deg Reset Water DT Full).

Reset Type 3: Controlled Water Temp Delta Reset — Reset Type 3 is an automatic controlled water temperature reset based on heat exchanger temperature difference. This function can be accessed by setting the following configurations:

1. Configure the controlled water temperature delta T at which no reset occurs (Controlled Water DELTA T → NO RESET).
2. Configure the controlled water temperature delta T at which full reset occurs (Controlled Water DELTA T → FULL RESET).
3. Enter the amount of reset (Deg Reset Water DT Full).

CAPACITY CONTROL — Capacity control provides chilled or condenser water temperature control by modulating the position of the inlet guide vane 1, and VFD speed for variable speed compressors.

If VFD OPTION is set to VFD and increased capacity is needed, the control will first try to increase IGV TARGET POSITION if it has not reached the travel limit; if the travel limit has been reached, the control increases VFD TARGET SPEED. If decreased capacity is needed, the control first tries to decrease VFD TARGET SPEED if it has not reached the minimum VFD speed; if the minimum VFD speed has been reached, the control decreases IGV TARGET POSITION instead. See Fig. 35.

From the compressor relay closed point to the end of ramp loading, the VFD TARGET SPEED is the configured VFD start-up speed. When the chiller is running normally, the capacity control determines whether and how much to change VFD TARGET SPEED. When the chiller is in the shut-down process, VFD TARGET SPEED will be the minimum VFD speed.

NOTE: If the VFD option is set to NO VFD, or the compressor relay is not closed, VFD TARGET SPEED will be 0.

The guide vane position is determined by the Capacity Control function under normal conditions and other functions in abnormal conditions, which include capacity inhibit request or capacity decrease request. The guide vane actuator is driven by comparing the guide vane target position and the actual position. The guide vane actual position can be viewed on the default screen, and ranges from zero to the guide vane travel limit configured from the Service Configuration menu. When the chiller is shutting down or off, the guide vane is always driven to zero.

RAMP LOADING — The ramp loading control slows the rate at which the compressor loads up. This control can prevent the compressor from loading up during the short period of time when the chiller is started and the chilled water loop has to be brought down to CONTROL POINT (Setpoint Table). Ramp loading helps reduce electrical demand charges by slowly bringing the chilled water to CONTROL POINT. The total power draw during this period remains almost unchanged.

Two methods of ramp loading are available: temperature ramp loading and motor load ramp loading.

Temperature Ramp Loading — Temperature ramp loading limits the rate at which the controlled water temperature decreases for cooling and increases for heating during ramping by reducing on cooling mode or increasing in heating mode the PULLDOWN SET POINT (Maintenance Menu → Capacity) at the configured rate, until the pulldown set point is less than the cooling mode control point or greater than the heating mode control point. The PULLDOWN RAMP TYPE (Configuration Menu → General Configuration) is configured to 0 for temperature ramp loading.

Motor Load Ramp Loading — Motor load ramp loading limits the rate at which either the line current percentage or motor kilowatt percentage increases by incrementing the ramp demand limit at the configured rate. The PULLDOWN RAMP TYPE (Configuration Menu → General Configuration) is configured to 1 for motor load ramp loading.

If DEMAND LIMIT SOURCE (Configuration Menu → General Configuration) is set to AMPS, then PERCENT LINE CURRENT is used for motor load ramp loading. If DEMAND LIMIT SOURCE is set to kW, then MOTOR PERCENT KILOWATTS is used for motor load ramp loading.

The motor load ramp loading algorithm shall be deactivated when the Ramp Demand Limit is greater than or equal to the ACTIVE DEMAND LIMIT (General Parameters). It is also deactivated when Ramp Demand Limit is greater than or equal to 60%. There will be a one-minute delay for the compressor to be uploaded to target load (ramping load target 60%) after ramping load demand limit is set to 60%.

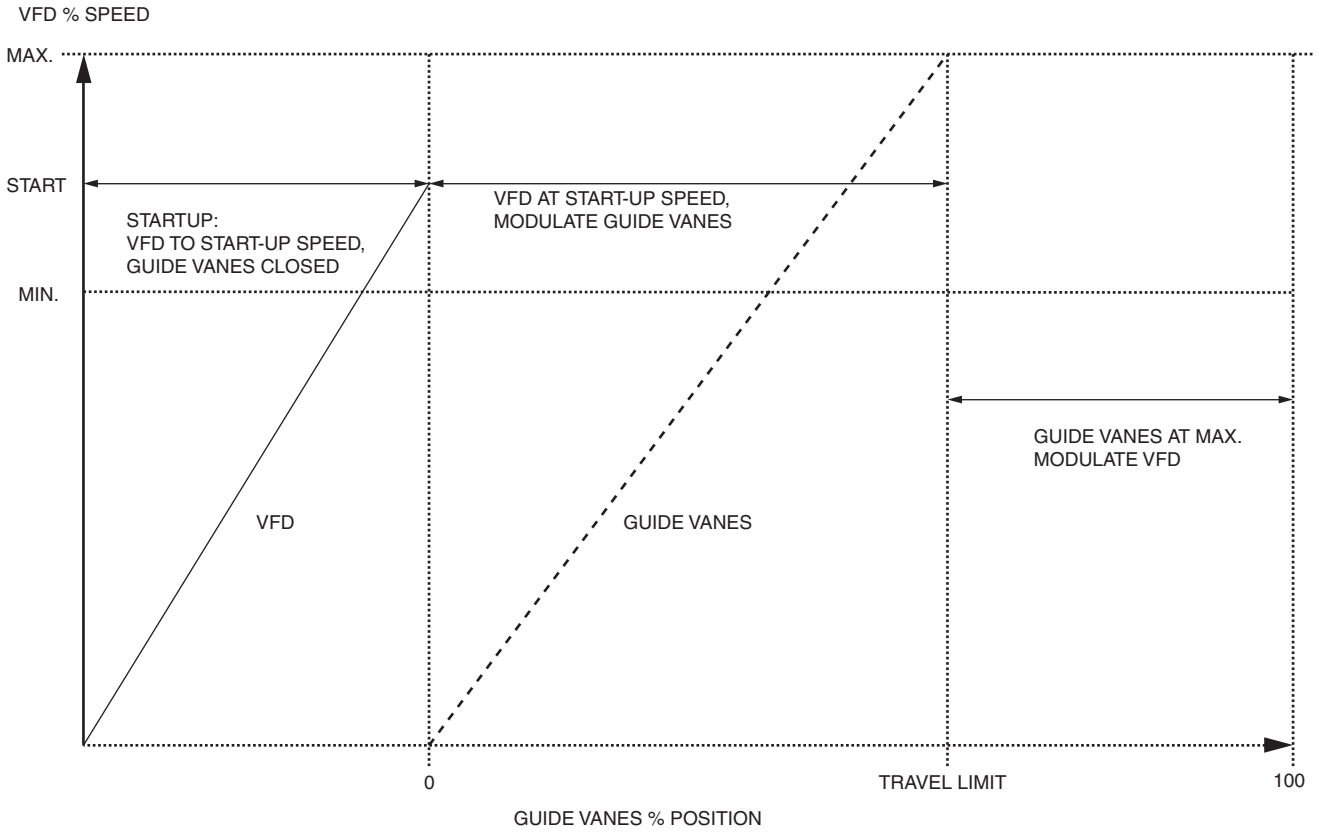


Fig. 35 — Guide Vane Position and VFD Speed

SURGE CORRECTION CONTROL — There are two stages for surge correction: envelope control (surge prevention) and surge protection.

Envelope Control — A surge condition occurs when the lift becomes so high that the gas flow across the impeller reverses. This condition can eventually cause compressor damage. The surge prevention algorithm notifies the operator that chiller operating conditions are marginal and to take action, such as lowering entering condenser water temperature, to help prevent compressor damage.

If a high sound condition occurs at low guide vane position, the HGBP valve is used to decrease the sound level. The envelope control algorithm is an operator-configurable feature that can determine if lift conditions are too high for the compressor and then take corrective action. High efficiency mode or low noise mode can be selected. Lift is defined as the difference between the saturated temperature at the impeller eye and at the impeller discharge. The maximum lift a particular impeller wheel can perform varies with the gas flow across the impeller and the size of the wheel.

If Actual Lift is higher than reference lift, a capacity inhibit signal will be sent. If Actual Lift is higher than reference lift plus Surge Line High Offset, a capacity decrease signal will be sent. If Actual Lift is lower than reference lift minus Surge Deadband, these 2 signals will be canceled. Capacity Control will respond to these 2 signals and make correction on IGV1 TARGET POSITION, VFD TARGET SPEED, and HGBP actuator.

Surge Protection — The Surge Protection algorithm will run after SURGE DELAY TIME has elapsed when compressor has been commanded to turn on. It compares the present PERCENT LINE CURRENT value with the previous value once every second. If the difference exceeds the maximum AMPS change value (SURGE DELTA % AMPS + [PERCENT LINE CURRENT / 10]), an incidence of surge has occurred, and the surge protection signal will be sent.

When an incidence of surge determined in this manner has occurred, the SURGE COUNTS will be incremented by one. On receiving the surge protection signal, Capacity Control will make corrections on IGV1 TARGET POSITION, VFD TARGET SPEED, and HGBP actuator. When correction is in effect, Surge Protection Count will be added every 10 seconds. If IGV, VFD and HGBP cannot be corrected, chiller will send a shutdown alarm when the surge count is greater than 4.

HOT GAS BYPASS (HGBP) CONTROL — The hot gas bypass function is used to artificially load the chiller and keep it running under low load conditions or to prevent surge conditions. Since this also reduces the performance of the machine, HGBP Control is a user-selectable option.

Hot gas bypass operation has three different modes when installed (hgbp_opt = 1) and enabled (hgbp_sel > 0):

- Hot gas bypass for surge correction — Each compressor has unique lift characteristics that can be plotted to determine performance. The controller will determine operating conditions that could result in compressor surge and activate the hot gas bypass valve to prevent surge until the chiller operating parameters are in a safe area on the curve where the valve may be closed again.
- Hot gas bypass for low load operation — In this condition, the hot gas bypass valve will be opened to prevent a recycle shutdown from occurring. The hot gas bypass valve will remain open until this minimal loading condition has passed and there is no surge condition present.
- Combination surge correction and low load operation — When this option is selected, both HGBP for surge prevention and HGBP for low load operation will be performed. Surge prevention will take higher priority if both conditions are satisfied.

ECONOMIZER DAMPER VALVE CONTROL — The economizer damper valve control maintains the difference between evaporator pressure and economizer pressure. Economizer pressure should always be higher than evaporator pressure.

NOTE: If the Chiller Type (Configuration Menu → Factory Parameters) is configured to Legacy, the economizer damper valve control is bypassed.

When the chiller is initially powered on, or when the compressor shuts down, the damper valve will be commanded to close. These and other conditions are shown in Table 13.

Table 13 — Economizer Damper Valve Status

SYSTEM CONDITION	ECONOMIZER DAMPER VALVE STATUS
Chiller initially powered on	Fully closed
Compressor shut down	Fully closed
During damper valve action delay	Fully closed
Economizer pressure > evaporator pressure + Damper valve open DB	Open
Economizer pressure < evaporator pressure + Damper valve close DB	Closed
All other conditions	Current position maintained

If the damper valve has been commanded to open for a continuous 5 minutes, and the Damper Valve Full Opened condition is still not TRUE, the control system generates an alert 154. Similarly, if the damper valve has been commanded to close for a continuous 5 minutes, and the Damper Valve Full Closed condition is still not TRUE, the control system generates an alert 154.

If the compressor is running and if economizer pressure becomes less than or equal to evaporator pressure, an alarm 268 will be tripped and compressor will be shut down.

DEMAND LIMIT — The PIC 5 controls provide a feature for limiting AVERAGE LINE CURRENT or MOTOR KILOWATTS by limiting capacity via guide vane control/VFD control. The limit may be applied in two ways. The first is called ACTIVE DEMAND LIMIT, which is equal to a BASE DEMAND LIMIT value (set in the SETPOINT screen, default value 100%). ACTIVE DEMAND LIMIT may also be forced to be different from BASE DEMAND LIMIT by manually overriding (forcing) the value via a CCN network device. If the DEMAND LIMIT SOURCE exceeds the ACTIVE DEMAND LIMIT by 5% or less, capacity will be inhibited. If the DEMAND LIMIT SOURCE exceeds the ACTIVE DEMAND LIMIT by more than 5%, capacity will be decreased.

Alternatively, the limit may be applied by by AUTO DEMAND LIMIT INPUT, an optional 4 to 20 mA input. This demand limit control option (4-20 mA DEMAND LIMIT TYPE) is externally controlled by a 4 to 20 mA signal. The option is set up on the Configuration Menu → GENERAL CONFIGURATION screen. When enabled, 4 mA will set ACTIVE DEMAND LIMIT to 100% of the DEMAND LIMIT SOURCE (regardless of the value of BASE DEMAND LIMIT), and 20 mA will set ACTIVE DEMAND LIMIT to the value configured for DEMAND LIMIT AT 20 mA in the Configuration Menu → SERVICE PARAMETERS screen.

OVERRIDE CONTROL — Capacity overrides can prevent some safety shutdowns caused by exceeding the motor amperage limit, evaporator refrigerant low temperature safety limit, motor high temperature safety limit, and condenser high pressure limit. In these cases there are two stages of capacity control:

1. When the value of interest crosses the first stage set point into the override region, the capacity is prevented from increasing further, and the status line on the PIC 5 controller indicates the reason for the override. Normal capacity control operation is restored when the value crosses back over the first stage set point, leaving the override region.
2. When the value of interest is in the override region and further crosses the second stage set point, the capacity is decreased until the value meets the override termination condition. The PIC 5 controls resume normal capacity control operation after the override termination condition has been satisfied. (In the case of high discharge superheat, there is an intermediate stage.)

Table 14 summarizes these override parameters.

Table 14 — Override Parameters

OVERRIDE CONDITION	OVERRIDE PARAMETER	FIRST STAGE CAPACITY INHIBIT	DEFAULT VALUE/ CONFIGURABLE RANGE	SECOND STAGE CAPACITY DECREASE	OVERRIDE TERMINATION
High condenser pressure override (high pressure vessel/heat machine)	CONDENSER PRESSURE	> COND PRESS OVERRIDE HIGH	250 psig/200-260 psig	> COND PRESS OVERRIDE HIGH + 2.4 psi	< COND PRESS OVERRIDE HIGH
High condenser pressure override (low pressure vessel/cool only)	CONDENSER PRESSURE	> COND PRESS OVERRIDE LOW	140 psig/90-150 psig	> COND PRESS OVERRIDE LOW + 2.4 psi	< COND PRESS OVERRIDE LOW
Low evaporator temperature override	CALC EVAP SAT TEMP or EVAP REFRIG LIQUID TEMP	< EVAP SAT OVERRIDE TEMP*		< EVAP SAT OVERRIDE TEMP - 1 F (0.56 C)	> EVAP SAT OVERRIDE TEMP
High motor temperature override	COMP MOTOR WINDING TEMP	> COMP MOTOR TEMP OVERRIDE	200 F/150-200 F (93.3 C/65.6-93.3 C)	COMP MOTOR WINDING TEMP > COMP MOTOR TEMP OVERRIDE + 10 F (5.6 C)	COMP MOTOR WINDING TEMP < COMP MOTOR TEMP OVERRIDE – 2 F (1.1 C)
High current override	PERCENT LINE CURRENT	PERCENT LINE CURRENT > 100%		PERCENT LINE CURRENT > 105%	PERCENT LINE CURRENT <= 100%
Low discharge superheat override	Discharge Superheat (DSH)	< DSH REQUIRED + 1		< DSH REQUIRED – 3	> DSH REQUIRED + 2
Low source temperature protection override	Leaving chilled water temperature (heating mode)	< COOLING LCW SETPOINT – 2° F (1.1° C)			> COOLING LCW SETPOINT – 2° F (1.1° C)

*EVAP SAT OVERRIDE TEMP = EVAP TRIPPOINT + EVAP OVERRIDE DELTA T

Other types of override events do not override control guide vane or VFD operation, but are reported:

- High compressor discharge temperature override — If the COMP DISCHARGE TEMP is greater than the COMP DISCHARGE ALERT threshold, then high discharge temperature override will be displayed in the main screen until the COMP DISCHARGE TEMP is less than the COMP DISCHARGE ALERT threshold – 2° F (1.1° C).
- High compressor bearing temperature override — If a compressor bearing temperature is greater than the compressor bearing temperature Alert (Configuration Menu → Protective Limit Config) threshold, then High Bearing Temp Override shall be set to TRUE until all of the compressor bearing temperatures are less than Comp Bearing Temp Alert minus 2° F (1.1° C).

RECYCLE CONTROL — The chiller may cycle off and wait until the load increases to restart when the compressor is running in a lightly loaded condition. This normal cycling is known as "recycle."

In cooling mode, a recycle shutdown is initiated when either of the following conditions is true:

- Leaving chilled water temperature (or entering chilled water temperature, if the EWT CONTROL OPTION is enabled) is more than 5° F (2.8° C) below the CONTROL POINT.
- Leaving chilled water temperature (or entering chilled water temperature, if the EWT CONTROL OPTION is enabled) is below the CONTROL POINT, and the chilled water temperature difference is less than the RECYCLE SHUTDOWN DELTA T.

In heating mode, a recycle cycle shutdown occurs when either of the following conditions is true:

- Leaving condenser water temperature (or entering condenser water temperature, if the EWT CONTROL OPTION is enabled) is more than 5° F (2.8° C) below the CONTROL POINT.
- Leaving condenser water temperature (or entering condenser water temperature, if the EWT CONTROL OPTION is enabled) is above the CONTROL POINT, and the condenser water temperature difference is less than the RECYCLE SHUTDOWN DELTA T.

NOTE: Recycle shutdown will not occur if the CONTROL POINT has been changed by more than 1° F (0.56° C) within the previous 5 minutes of operation.

When the chiller is in RECYCLE mode, the chilled water pump relay remains energized so the chilled water temperature can be monitored for increasing load. The recycle control uses RECYCLE RESTART DELTA T to check when the compressor should be restarted. In cooling mode, the compressor will restart when the leaving chilled water temperature (or entering chilled water temperature, if the EWT CONTROL OPTION is enabled) is greater than the CONTROL POINT plus the RECYCLE RESTART DELTA T for 5 consecutive seconds. In heating mode, the compressor will restart when the leaving condenser water temperature (or entering condenser water temperature, if the EWT CONTROL OPTION is enabled) is less than the CONTROL POINT minus the RECYCLE RESTART DELTA T for 5 consecutive seconds.

RUNNING TIMERS AND COUNTERS — The PIC 5 control maintains two run-time clocks: COMPRESSOR ONTIME and SERVICE ONTIME. COMPRESSOR ONTIME indicates the total lifetime compressor run hours. SERVICE ONTIME is a resettable timer that can be used to indicate the hours since the last service visit or any other event. A separate counter tallies compressor starts as TOTAL COMPRESSOR STARTS. All of these can be viewed on the RUN TIMES screen. Both Ontime counters roll over to 0 at 500,000 hours. Manual changes to SERVICE ONTIME from the screen are permitted at any time. If the controller is replaced, one opportunity before the first start-up with the new controller is provided to set COMPRESSOR ONTIME and TOTAL COMPRESSOR STARTS to the last readings retained with the prior controller.

The chiller also maintains a start-to-start timer and a stop-to-start timer. These timers limit how soon the chiller can be started and are displayed on the system overview (home) and RUN TIMES screens. They can be configured in the Configuration Menu → GENERAL CONFIGURATION screen. They must expire before the chiller starts. If the timers have not expired, the RUN STATUS parameter on the System Overview (Home) and GENERAL PARAMETERS screen reads TIMEOUT.

WATER PUMPS CONTROL (FREEZE PREVENTION)

NOTE: In order to energize the chilled and condenser pump to prevent evaporator and condenser tube freeze-up, the hydraulic system should be enabled first (this can be configured in the Configuation Menu → FACTORY PARAMETERS screen).

Evaporator Freeze Prevention —When the evaporator saturated refrigerant temperature or evaporator refrigerant temperature is less than the EVAP REFRIG TRIPPOINT + REFRIG OVERRIDE DELTA T (configurable from 2° F to 5° F (1.1° C to 2.8° C) in the Configuration Menu → PROTECTIVE LIMIT CONFIG screen), an OVERRIDE—LOW EVAP REFRIG TEMP event will occur.

For any running status, Protective Limit Alarm State 261 will be displayed and the unit will shut down if either of the following conditions is true:

- Evaporator saturated refrigerant temperature or evaporator refrigerant temperature is equal to or less than the EVAP REFRIG TRIPPOINT (33 F [0.6 C] for water, (configurable for brine in Configuration Menu → PROTECTIVE LIMIT CONFIG screen) plus 1° F (0.56° C).
- Leaving chilled water temperature or entering chilled water temperature is less than EVAP REFRIG TRIPPOINT plus 1° F (0.56° C).

NOTE: If the chiller is in recycle mode, it will transition to TRIPOUT, and the CHILLED WATER PUMP will remain on.

The alarm will be clearable when the evaporator saturated refrigerant temperature, evaporator refrigerant temperature, leaving chilled water temperature, and entering chilled water temperature rise 5° F (2.8° C) above the EVAP REFRIG TRIPPOINT.

Condenser Pump Control —The chiller will monitor the condenser pressure and may turn on the condenser pump. If the condenser pressure is greater than or equal to the COND PRESS OVERRIDE, and the entering condenser water temperature is less than 115 F (46.1 C), the condenser pump will energize to try to decrease the pressure and alert 157 will be generated. The pump will turn off when the condenser pressure is 3.5 psi (24.1 kPa) less than the pressure override and the condenser refrigerant temperature) is less than or equal to the entering condenser water temperature plus 3° F (1.7° C).

NOTE: COND PRESS OVERRIDE is found in the Configuration Menu → PROTECTIVE LIMIT CONFIG screen. The default value is 140 psig (965 kPa) for low pressure condenser and 250 psig (1724 kPa) for high pressure condenser.

Condenser Freeze Prevention — This control helps prevent condenser tube freezing by energizing the condenser pump relay. The PIC 5 module controls the pump and, by starting it, helps to prevent the water in the condenser from freezing.

When the chiller is off and condenser saturated refrigerant temperature is less than or equal to the condenser freeze point, the condenser water pump will be energized (Alarm State 262, PROTECTIVE LIMIT - CONDENSER FREEZE). The fault state will clear and the pump will turn off when the condenser saturated refrigerant temperature is more than 5° F (2.7° C) above the condenser freeze point and the entering condenser

water temperature is greater than the condenser freeze point. If the chiller is in recycle shutdown mode when the condition occurs, the controls will transition to a non-recycle shutdown.

CONTROL TEST — This feature allows the operator to quick-test the controls and related hardware, including all unit-controlled outputs except compressor output.

The unit must be off to run the test function. If the unit is on, the test function cannot be accessed. The compressor can only be started after the control test is finished (QCK_TEST = FALSE). The test function also requires the user to enter the User password if it has not already been entered. All control test parameters are accessible through the QCK_TEST table. To perform the control test function, set the first item Quick Test Enable in the QCK_TST table to Enable.

Unless otherwise noted, all protective limits remain active during the controls test.

Discrete Outputs — When the control test is enabled, discrete outputs can be enabled by setting the corresponding points to Yes in the QCK_TST table.

NOTE: The following outputs cannot be enabled at the same time Guide Vane Increase and Guide Vane Decrease are enabled: HGBP Valve Open and HGBP Valve Close; Economizer Damper Valve Open and Economizer Damper Valve Close.

NOTE: For oil pressure, a value ≥ 18 psi within 40 seconds after the oil pump is turned on indicates a confirmation of pressure (Oil Pres Test Passed=YES).

Analog Output — When the control test is enabled, the following analog outputs can be enabled by entering the positions in the QCK_TST table:

- Head Pressure Valve
- Diffuser Actuator
- Chiller Status Output (Q_CHST)

Guide Vane Calibration — The guide vane position should be calibrated before starting the chiller. Guide vane calibration can be started by setting Quick Test Enable to Enable and GV1 Calibration Enable to Enable.

If the actuator type is digital (POS) 0, then:

- The fully closed guide vane feedback resistance will be in the range of 62.5 ohms to 688 ohms (350 ± 75 ohms target setting).
- The fully opened guide vane feedback resistance will be in the range of 6190 ohms to 11,496 ohms (10,000 ohms target setting).

If the actuator type is analog (1):

- The fully closed guide vane feedback mA value will be in the range of 3 mA to 5 mA.
- The fully opened guide vane feedback mA value will be in the range of 19 mA to 20.8 mA.

SWIFT RESTART — This function is used for data center applications. It allows the chiller to be restarted swiftly to meet building load requirements.

To enable this function, the AUTO RESTART OPTION point in the CONF_OPT table should be set to ENABLE.

The water flow verification time, oil prelube time and other delays will be decreased accordingly. If the control system and oil system are equipped with UPS (uninterrupted power supply), the start-up time will be decreased accordingly.

COOLING TOWER CONTROL — If WATER PRESSURE OPTION in the CONF_OPT table is set to ENABLED, there will be another optional hydraulic control I/O board in the PIC5 control system to allow PIC5 control for the water pumps and cooling tower fans (high speed and low speed).

The cooling tower fans are controlled by the pressure difference between condenser and evaporator and entering water temperature of condenser. The objective is to maintain the entering condenser water temperature in the optimal range.

HEAD PRESSURE CONTROL — If the chiller system is equipped with a head pressure control valve, and the HEAD PRESSURE VALVE option in the CONF_OPT table is ENABLED, the PIC5 control system will control the opening of the head pressure valve to maintain the pressure difference between condenser and evaporator. The output of this valve is 4 to 20 mA type.

Before using this function, the pressure difference values for 20 mA and 4 mA should be set.

The head pressure valve should be in fully closed position when chiller is in OFF mode.

ICE BUILD OPTION — The PIC5 controller provides an ice build option based on efficiency improving point. The ICE BUILD OPTION in the CONF_OPT table should be set to ENABLED to make ice build active, and the following two parameters should be configured:

- Ice_recy (ICE BUILD RECYCLE) indicates whether recycle option is enabled in ice build mode.
- Ice_term (ICE BUILD TERMIN SOURCE) indicates how the ice build is terminated. There are three types: temperature (0), dry contact (1), or combined temperature and dry contact (2).

TIME SCHEDULE — The PIC 5 control provides three schedules:

- Local schedule - OCCPC01S
- Ice build schedule - OCCPC02S
- Network schedule - OCCPC03S

Each schedule has 8 time segments. If two time segments overlap, the unoccupied time segment takes priority.

There are 16 holiday time segments. Each holiday time segment is determined by three parameters—month, start date, and holiday days. The controller will be in unoccupied mode when a holiday time segment is active.

BLACK BOX — The black box task continuously stores operation parameters in memory every 5 seconds. Up to 20 collects can be stored before a chiller operation alarm event to avoid filling the buffer unnecessarily. Each collect contains up to 180 records (15 minutes), with 168 records (14 minutes) before the alarm event and 12 records (1 minute) after the event. The black box task uses the "rotary" rule to fill the records in the buffer (first in first out). Each record is associated with a time in hour, minute, and second. When 12 records have been collected after the process alarm event, the black box task stops the collect, transfers the information into a .csv file, and starts to fill another event record. The RAM memory writing is never stopped, so if another alarm event occurs there is no data loss. (If power is lost, only the .csv files remain. Data in RAM memory is lost.)

The black box file can be uploaded with the Carrier S-Service tool. Once the upload is done, the data collect erase flag will be sent from the Carrier S-Service and the collect buffer will be erased.

PRESSURE TRANSDUCER CALIBRATION — The HMI pressure readings are displayed in the Main Menu → Pressures screen. See Fig. 36 and 37.

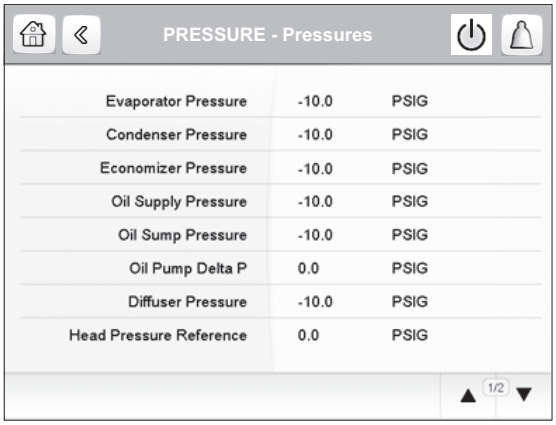


Fig. 36 — PRESSURE Screen, Page 1

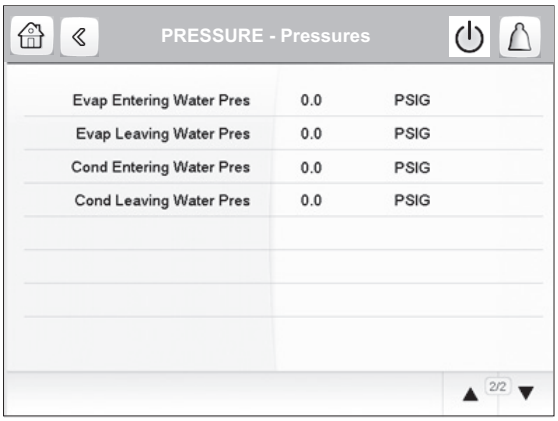


Fig. 37 — PRESSURE Screen, Page 2

Once a year the pressure transducers should be checked against a pressure gage. Attach a set of accurate refrigeration gages to the tranducer being checked and compare the two readings. If there is a difference the transducer can be calibrated as described below (the Oil Pump Delta P reading should be zero when the compressor is off). Calibration requires Service level access to the HMI.

NOTE: It is usually not necessary to calibrate at initial start-up unless chiller is at high altitude.

1. Go to Main Menu → Maintenance Menu → Pressure Sensor Calib. See Fig. 38 and 39.

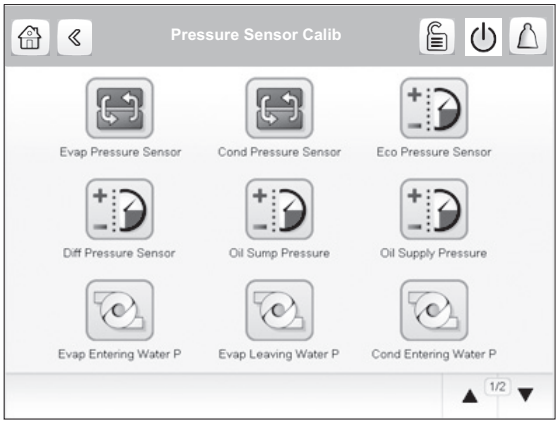


Fig. 38 — Pressure Sensor Calib Screen, Page 1

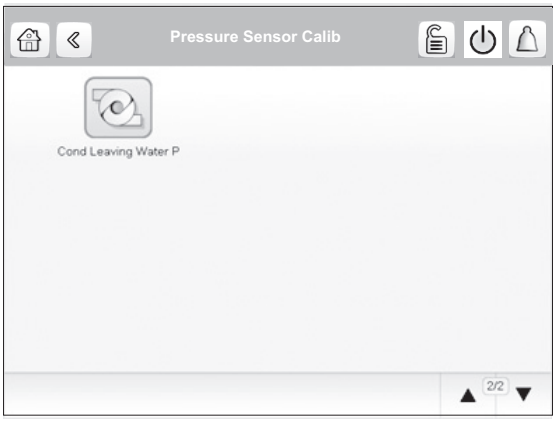


Fig. 39 — Pressure Sensor Calib Screen, Page 2

2. Each transducer is supplied with 5 vdc from the IOB. Calibration is done by selecting the appropriate Pressure Sensor option on the Pressure Sensor Calib screen. The screen for the selected option is displayed. Figure 40 shows the Evap Pressure Sensor screen as an example.

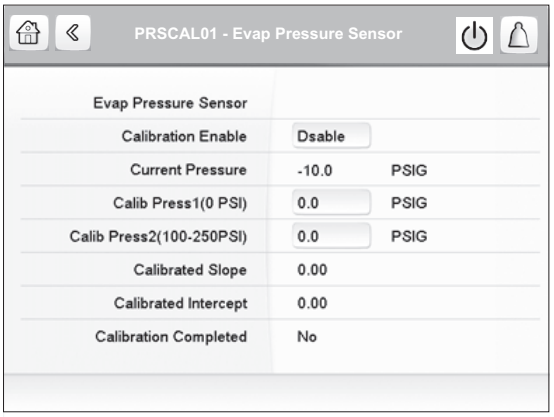


Fig. 40 — Evap Pressure Sensor Screen

3. With the transducer at atmospheric pressure (zero gage pressure), ensure that "Calib Press1 (0 PSI)" = 0 PSIG.
4. Pressurize the transducer to a known pressure between 100 and 250 psig, and enter that known pressure in the "Calib Press2 (100-250PSI)" field.
5. Set Calibration Enable to Enable.

   Calibration for this sensor is complete and the new slope and intercept will be used for the calibrated transducer in the pressure or temperature tables.

ALARM EMAIL — The alarm email function sends automatic email messages to specified service personnel for remote maintenance purposes. Use the service configuration table EMAILCFG, available from page 2 of the Configuration menu, to set up the email function. After the EMAILCFG table configuration is done, a test email will be sent. See Fig. 41-43.

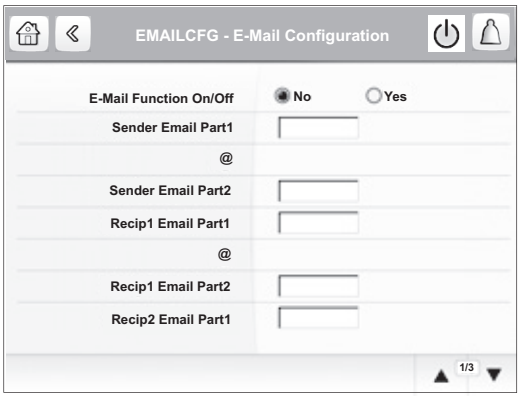


Fig. 41 — EMAILCFG Screen, Page 1

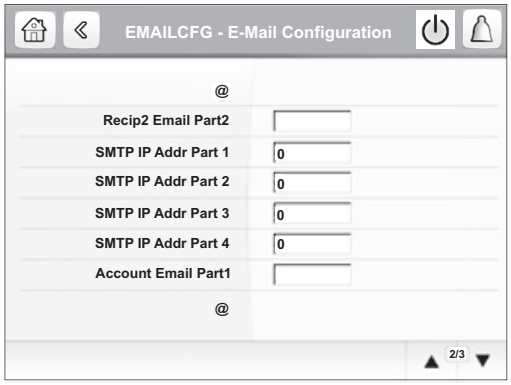


Fig. 42 — EMAILCFG Screen, Page 2

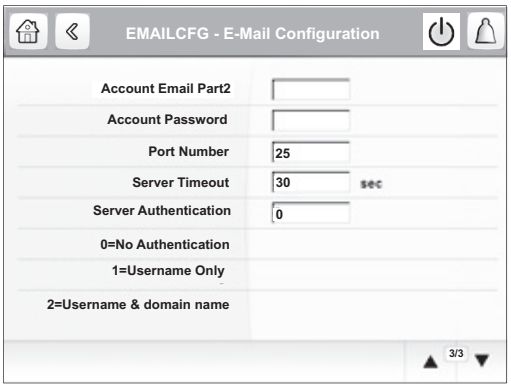


Fig. 43 — EMAILCFG Screen, Page 3

The alarm task runs periodically. At each alarm task run time, the status change of each alarm is checked and one email message is sent to each specified recipient when one or more alarms are switched on. When all alarms return to normal, another e-mail message is sent to remote maintenance service personnel.

The e-mail message provides the unit description and location stored in the CTRL_ID table, available from the CONFIGURATION menu. See Fig. 44.

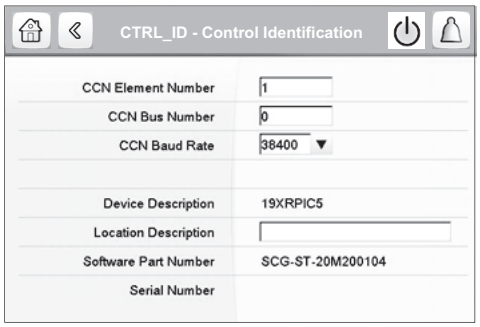


Fig. 44 — CTRL_ID Screen

PROGNOSTICS — This advanced diagnostic and prognostic function is designed to enable the service engineer to resolve problems before they affect operating efficiency and the chiller bottom line. The CONF_PRG (Prognostics Config) screen is available from the Configuration Menu. See Fig. 45 and 46.

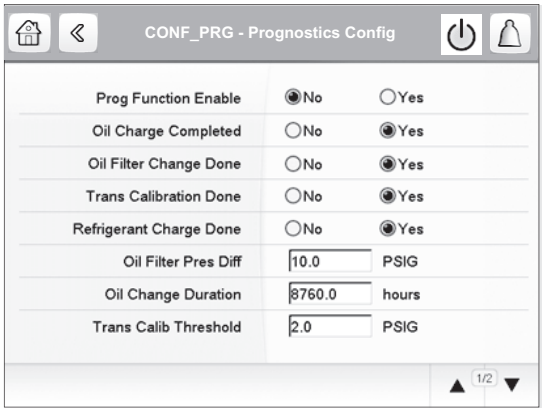


Fig. 45 — Prognostics Config Screen, Page 1

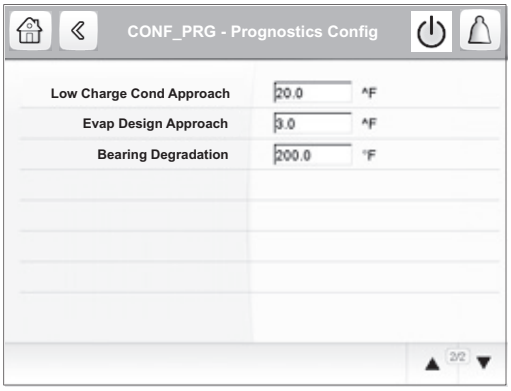


Fig. 46 — Prognostics Config Screen, Page 2

The following functions are available if the Prog Function Enable option is set to YES (prog_en=YES):

Oil Change Notification — The lubrication oil should be changed periodically in order to keep the appropriate lubrication for the motor and compressor. Once the period set in the Oil Change Duration field is expired, a statement is displayed to warn the user "to replace the oil charge or confirm the additive level is adequate and has not depleted." After correction items have been finished, set the Oil Charge Completed option to YES manually.

Oil Filter Alert — This function is active only in an oil pump control test. If the oil pump is forced to ON and after 10 seconds, if the pressure differential between oil pump pressure and oil discharge pressure is lower than the threshold set in the Oil Filter Pres Diff field, the filter needs to be replaced and the dedicated alert 160 is reported until the oil pressure differential is higher than the alert threshold plus 2 psig. Then set the Oil Filter Change Done option to YES manually.

Refrigerant Transducer Calibration — When the unit is offline for more than 5 minutes, a comparison is made of the evaporator, condenser, and economizer refrigerant pressure transducers. A difference of more than the configurable threshold set in the Trans Calib Threshold option generates an alert 161 that a calibration is required. The comparison is done for all of the transducers. After calibration, set the Trans Calibration Done option to YES manually.

Low Refrigerant Charge — This function uses the evaporator approach (Evap Design Approach) setting and compressor discharge temperature (Bearing Degradation) setting in relation to the condenser refrigerant temperature (Low Charge Cond Approach) setting to generate an alert 162 of possible low refrigerant charge. After correcting the charge, set the Refrigerant Charge Done option to YES manually.

MASTER SLAVE CONTROL — This control, available from page 2 of the Configuration Menu, provides the capability to operate 2 chillers in Master/Slave mode. The slave chiller should be set to NETWORK mode and controlled by the master chiller.

The two chillers can be configured to be in parallel or in series. When they are in series mode, master and slave chillers can be configured to be upstream or downstream. The master chiller monitors all external commands, such as start/stop, demand limiting, or setpoint configuration.

The master/slave function provides the ability to select a lead chiller from the master and the slave chillers. Selection is based on the delta between the master and the slave run hours, and tries to optimize the runtime hours. If this function is not set, the lead chiller is always the master chiller and should be changed to lag when it fails.

The lead chiller shall always be started first, and the lag chiller shall be maintained at zero percent capacity. When the lead chiller cannot be loaded anymore, then the lag start timer is started. The lag chiller shall always be stopped first.

If a communication failure is detected between the master and the slave chillers, all master/slave functions are disabled and chillers return to stand-alone operations until communication is reestablished.

Displaying Data Trends — The PIC 5 control system offers the ability to configure and display system trends wiwthout a password. Select Main Menu → Trendings.

On the Trendings screen (see Fig. 47), check the data to be tracked. Set the beginning and end points for the selected data. To change a color, select the colored square and choose a new color from the pop-up color bar. To view data trends, select the down arrow at the bottom right of the Trendings screen. The next page displays the selected data in the chosen colors. See Fig. 48.

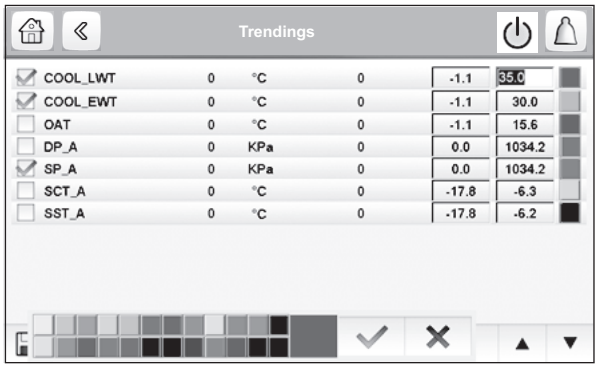


Fig. 47 — Data Logging and Trending Screen Set-Up Page

Fig. 48 — Data Logging and Trending Screen Display Page

DIAGNOSTICS AND TROUBLESHOOTING

The 19XR PIC 5 control system has many fault tracing aid functions. The local interface and its various menus give access to all unit operating conditions.

If an operating fault is detected, an alarm is activated. The alarm code is displayed in the Alarms menu, sub-menus Reset alarms and Current alarms. The control may record up to 10 current alarms.

Displaying Alarms — The alarm icon on the interface (see the section Icons on page 17) indicates unit status as follows:

- A flashing LED shows that the unit is operating but there is an alert.
- A steady LED shows that the unit has been shut down due to a fault.

The Reset Alarms option on the main menu displays up to five alarm codes that are active on the unit. Table 15 lists alarm codes. The Current Alarms option displays details for each alarm.

Resetting Alarms — When the cause of the alarm has been identified and corrected, the alarm can be reset either automatically or manually (depending on the type of alarm). Alarms can be reset without stopping the machine.

In the event of a power supply interrupt, if Auto Restart Option is set to ENABLE in the Option Configuration menu, the unit restarts automatically without the need for an external command. However, any faults active when the supply is interrupted are saved and in certain cases may prevent a unit from restarting.

A manual reset must be run from the main menu via the ALARMRST menu, item RST_ALM.

Once the alarm has been corrected or reset, all information regarding solved alarms is stored in the Alarm History. See Appendix A, page 94.

Alert Codes — Table 16 lists PIC 5 alert codes. These are automatically reset when the situation returns to normal.

Table 15 — PIC 5 Alarm Codes

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
TEMPERATURE SENSOR FAULTS				
Alm-200	ALM-200 Sensor Fault — Leaving Chilled Water	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between leaving chilled water temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring.
Alm-201	ALM-201 Sensor Fault — Entering Chilled Water	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between entering chilled water temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-202	ALM-202 Sensor Fault — Leaving Cond Water Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between leaving condenser water temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-203	ALM-203 Sensor Fault — Entering Cond Water Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between entering condenser water temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-204	ALM-204 Sensor Fault — Comp Discharge Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between compressor discharge temperature sensor and connector. Check for disconnected, grounded, or shorted wiring.
Alm-205	ALM-205 Sensor Fault — Oil Sump Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between oil sump temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring.
Alm-206	ALM-206 Sensor Fault — Oil Supply Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between oil supply temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring.
Alm-207	ALM-207 Sensor Fault — Evap Refrig Liquid Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between evaporator refrigerant liquid temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
TEMPERATURE SENSOR FAULTS (CONT)				
Alm-208	ALM-208 Sensor Fault — Low Speed Motor End Bearing Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between low speed motor end bearing temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-209	ALM-209 Sensor Fault — Low Speed Comp End Bearing Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between low speed compressor end bearing temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-210	ALM-210 Sensor Fault — High Speed Motor End Bearing Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between high speed motor end bearing temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-211	ALM-211 Sensor Fault — High Speed Comp End Bearing Temp	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between high speed compressor end bearing temperature sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-212	ALM-212 Sensor Fault — Compressor Motor Temp 1	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between compressor motor temp 1 sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-213	ALM-213 Sensor Fault — Compressor Motor Temp 2	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between compressor motor temp 2 sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.
Alm-214	ALM-214 Sensor Fault — Compressor Motor Temp 3	Automatic if the temperature measured by the sensor returns to normal	Unit shuts down	Check sensor resistance. Check for proper wiring between compressor motor temp 3 sensor and IOB connector. Check for disconnected, grounded, or shorted wiring. Check IOB channel type configurations.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PRESSURE TRANSDUCER FAULTS				
Alm-215	ALM-215 Sensor Fault — Condenser Pressure	Automatic if the voltage measured by the sensor returns to normal	Unit shuts down	Check condenser pressure transducer wiring. Confirm that 5 v reference signal is available between IOB connector. Check for disconnected, grounded, or shorted wiring. Check for condensation in transducer connector. Check SW2 dip switch in IOB for the channel configuration.
Alm-216	ALM-216 Sensor Fault — Evaporator Pressure	Automatic if the voltage measured by the sensor returns to normal	Unit shuts down	Check evaporator pressure transducer wiring. Confirm that 5 v reference signal is available between IOB connector. Check for disconnected, grounded, or shorted wiring. Check for condensation in transducer connector. Check SW2 dip switch in IOB for the channel configuration.
Alm-217	ALM-217 Sensor Fault — Economizer Pressure	Automatic if the voltage measured by the sensor returns to normal	Unit shuts down	Check economizer pressure transducer wiring. Confirm that 5 v reference signal is available between IOB connector. Check for disconnected, grounded, or shorted wiring. Check for condensation in transducer connector. Check SW2 dip switch in IOB for the channel configuration.
Alm-218	ALM-218 Sensor Fault — Diffuser Pressure	Automatic if the voltage measured by the sensor returns to normal	Unit shuts down	Check diffuser pressure transducer wiring. Confirm that 5 v reference signal is available between IOB connector. Check for disconnected, grounded, or shorted wiring. Check for condensation in transducer connector. Check SW2 dip switch in IOB for the channel configuration.
Alm-219	ALM-219 Sensor Fault — Oil Sump Pressure	Automatic if the voltage measured by the sensor returns to normal	Unit shuts down	Check oil sump pressure transducer wiring. Confirm that 5 v reference signal is available between IOB connector. Check for disconnected, grounded, or shorted wiring. Check for condensation in transducer. Check SW2 dip switch in IOB for the channel configuration.
Alm-220	ALM-220 Sensor Fault — Oil Supply Pressure	Automatic if the voltage measured by the sensor returns to normal	Unit shuts down	Check oil supply pressure transducer wiring. Confirm that 5 v reference signal is available between IOB connectors. Check for disconnected, grounded, or shorted wiring. Check for condensation in transducer connector. Check SW2 dip switch in IOB for the channel configuration.
PRESTART FAILURES				
Alm-230	ALM-230 Prestart Failure — High Bearing Temperature	Manual	Unit shuts down. Compressor is not allowed to start.	Check Comp Bearing Temp in Temperature screen. Check oil heater and oil cooler for proper operation. Check for low oil level, partially closed oil supply valves, clogged oil filters. Check the compressor bearing temperature sensor wiring and accuracy to IOB connector. Check Comp Bearing Temp Alert setting.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PRESTART FAILURES (CONT)				
Alm-231	ALM-231 Prestart Failure — High Motor Temperature	Manual	Unit shuts down. Compressor is not allowed to start.	Check Comp Motor Wind Temp in Temperature screen. Check motor temperature sensor for wiring and accuracy to IOB connector. Check motor cooling line and isolation valves for proper operation or restrictions, check refrigerant filter/drier. Check for excessive starts within a short time span. Check Comp Motor Temp Override setting.
Alm-232	ALM-232 Prestart Failure — High Discharge Temperature	Manual	Unit shuts down. Compressor is not allowed to start.	Check Comp Discharge Temp in Temperature screen. Allow compressor discharge temperature sensor to cool. Check compressor discharge temperature sensor wiring and accuracy to IOB connector. Check for excessive starts. Check Comp Discharge Alert setting.
Alm-233	ALM-233 Prestart Failure — Low Refrigerant Temperature	Manual	Unit shuts down. Compressor is not allowed to start.	Check Evaporator Pressure, Evap Sat Refrig Temp, and Evap Refrig Liquid Temp in Temperature screen. Check Evaporator Pressure transducer and Evaporator Refrigerant Liquid Temperature sensor wiring and accuracy to IOB connector. Check for low chilled water supply temperatures. Check refrigerant charge. Check REFRIG OVERRIDE DELTA T and EVAP REFRIG TRIPPOINT in Configuration screen.
Alm-234	ALM-234 Prestart Failure — Low Line Voltage	Manual	Unit shuts down. Compressor is not allowed to start.	Check ACTUAL LINE VOLTAGE. Check UNDERVOLTAGE THRESHOLD in ISM_CONF screen. Check voltage supply. Check wiring to ISM J3-L1, J3-L2, and J3-L3. Check voltage transformers and switch gear. Consult power utility if voltage is low.
Alm-235	ALM-235 Prestart Failure — High Line Voltage	Manual	Unit shuts down. Compressor is not allowed to start.	Check ACTUAL LINE VOLTAGE. Check OVERVOLTAGE THRESHOLD in ISM_CONF screen. Check voltage supply. Check voltage transformers and switch gear. Consult power utility if voltage is high.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PRESTART FAILURES (CONT)				
Alm-236	ALM-236 Guide Vane 1 — Calibration Not Completed	Manual	Unit shuts down. Compressor is not allowed to start.	Perform Guide Vane Calibration in Quick Test screen. Check guide vane actuator feedback potentiometer and wiring to IOB connector.
PROTECTIVE LIMITS				
Alm-250	ALM-250 Protective Limit — Oil Pressure Difference Failure	Manual	Unit shuts down.	Check oil pump. Check oil filter. Check oil pump wiring.
Alm-251	ALM-251 Protective Limit — Low Chilled Water Flow	Manual	Unit shuts down.	Perform Chilled Water pump test in Quick Test screen. Check evaporator refrigerant liquid temperature and leaving chilled water temperature sensor accuracy and wiring to IOB. Check chilled water valves, pumps, and strainers. Check EVAP REFRIG TRIPPOINT, EVAP APPROACH ALERT, EVAP FLOW DELTA P CUTOUT, and WATER FLOW VERIFY TIME settings. Check load resistors, optional water flow switches or water flow delta P transducer calibration and wiring to IOB. Check for 5.0 v reference voltage between IOB connectors.
Alm-252	ALM-252 Protective Limit — Low Condenser Water Flow	Manual	Unit shuts down.	Perform Condenser Water pump test in Quick Test screen. Check condenser pressure transducer and leaving condenser water temperature sensor accuracy and wiring. Check condenser water valves and strainers. Check COND PRESS OVERRIDE, COND APPROACH ALERT, COND FLOW DELTA P CUTOUT, and WATER FLOW VERIFY TIME settings. Check load resistors, optional water flow switches or water flow delta P transducer calibration and wiring to IOB. Check for 5.0 v reference voltage between IOB connectors.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PROTECTIVE LIMITS (CONT)				
Alm-253	ALM-253 Protective Limit — High Discharge Temperature	Manual	Unit shuts down.	Check for closed compressor discharge isolation valve. Check if chiller was operating in surge conditions. Check compressor discharge temperature sensor resistance or voltage drop. Check for proper wiring to IOB connectors. Check for proper condenser flow and temperature. Check for proper inlet guide vane and optional diffuser actuator operation. Check for COMP DISCHARGE TEMP > 220 F (104 C) Check for fouled tubes, plugged water strainers, or noncondensables in the condenser.
Alm-254	ALM-254 Protective Limit — Low Evaporator Refirgerant Temperature	Manual	Unit shuts down.	Check for proper refrigerant charge. Check float valve operation. Check for closed condenser liquid line isolation valve. If problem occurs at high load, check for low condenser pressure which causes inadequate refrigerant flow through condenser flasc orifices. Check for proper chilled water flow and temperature. Confirm that condenser water enters bottom row of condenser tubes first (reversed condenser water flow may cause refrigerant to stack in the condenser). Check evaporator pressure transducer and evaporator refrigerant liquid temperature and leaving chilled water sensors. Check for division plate gasket bypass. Check for fouled tubes. Check pressure transducer and temperature sensor wiring to the IOB.
Alm-255	ALM-255 Protective Limit — High Motor Temperature	Manual	Unit shuts down.	Check compressor motor winding temperature sensor accuracy and wiring to IOB. Check motor cooling line and spray nozzle for proper operation or restrictions. Check motor cooling filter/drier and isolation valves. Look for refrigerant flow through motor cooling line sight glass. Check for excessive starts within a short time span.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PROTECTIVE LIMITS (CONT)				
Alm-256	ALM-256 Protective Limit — High Bearing Temperature	Manual	Unit shuts down.	Check oil heater for proper operation; confirm that oil heater is de-energized when compressor is running. Check for low oil level, partially closed oil line isolation valves, or clogged oil filter. Check oil cooler refrigerant thermal expansion valves; confirm that expansion valve bulbs are secured to the oil lines and insulated. Check compressor bearing temperature sensors accuracy and wiring to IOB. This fault can result from excessive operation at low load with low water flow to the evaporator or condenser. Very high discharge and volute temperatures may increase the oil sump temperature. Elevated sump temperature may result from an excessively high oil level reaching the bottom of the bull gear, causing it to churn the oil.
Alm-257	ALM-257 Protective Limit — High Condenser Temperature	Manual	Unit shuts down.	Check CONDENSER PRESSURE. Check for high condenser water temperatures, low water flow, fouled tubes. Check for division plate/gasket bypass or plugged condenser water strainers. Check for noncondensables in condenser. Check condenser pressure transducer wiring and accuracy to IOB. Configure COND PRESS OVERRIDE in configuration screen. NOTE: This alarm is not caused by the high condenser pressure switch.
Alm-258	ALM-258 Protective Limit — Spare Safety Device	Manual	Unit shuts down.	Spare safety input has been closed.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PROTECTIVE LIMITS (CONT)				
Alm-259	ALM-259 Protective Limit — Excessive Compressor Surge	Manual	Unit shuts down.	Five SURGE PROTECTION COUNTS occurred within SURGE TIME PERIOD. VFD Only: Surge prevention alarm declared when ACTUAL VFD SPEED is at least 90%. Check for high condenser water temperatures, low water flow, fouled tubes. Check CONDENSER APPROACH. Check condenser water strainers. Check for division plate/gasket bypass. Check for noncondensables in condenser. Check surge prevention parameters in OPTIONS screen. Compare cooling tower control settings and performance against design/selection temperatures across the entire operating range of the chiller. Check EVAPORATOR APPROACH and chilled water flow.
Alm-260	ALM-260 Protective Limit — Compressor Start Relay Start Failure	Manual	Unit shuts down.	Check motor starter 1M contactor wiring. Check ISM current sensors.
Alm-261	ALM-261 Protective Limit — Evaporator Freeze	Manual	Unit shuts down.	Check CALC EVAP SAT TEMP, EVAP REFRIG LIQUID TEMP, and EVAP REFRIG TRIPPOINT. Check for proper refrigerant charge. Check float valve operation. Confirm that optional refrigerant liquid line isolation valve is open. Check for proper Chilled Water flow and temperature. Confirm that condenser water enters bottom row of condenser tubes first (reversed condenser water flow may cause refrigerant to stack in the condenser). Check evaporator pressure transducer and evaporator refrigerant liquid temperature sensor. Check for evaporator water box division plate gasket bypass. Check for fouled tubes.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PROTECTIVE LIMITS (CONT)				
Alm-262	ALM-262 Protective Limit — Condenser Freeze	Manual	Unit shuts down.	The Cond Sat Refrig Temp is less than the Condenser Freeze Point. Check Condenser Freeze Point in configuration. Condenser water too cold or chiller shut down with brine below 32 F (0° C) in cooler so equalization temperature in chiller approached 32 F (0° C). Check condenser pressure transducer and wiring to IOB. Check condenser water temperature sensors and wiring to IOB. Check refrigerant charge.
Alm-265	ALM-265 Protective Limit — Refrigerant Leak	Manual	Unit shuts down.	REFRIGERANT LEAK OPTION is Enabled and the REFRIGERANT LEAK SENSOR output exceeded REFRIGERANT LEAK ALARM mA. Check for refrigerant leaks. Check leak detector for proper operation. Check REFRIGERANT LEAK ALARM mA setting in the OPTIONS screen. Check 4 to 20 mA or 1 to 5 v output from refrigerant leak sensor to IOB. Confirm that IOB SW2 dip switch 1 is in the correct position.
Alm-266	ALM-266 Protective Limit — IOB Low Voltage	Automatic	Unit shuts down.	Check IOB 24 VAC power supply and the transformer output voltage.
Alm-267	ALM-267 Protective Limit — Guide Vane Fault	Manual	Unit shuts down.	Alarm before start indicates guide vane opening has not closed to less than 4%. Alarm while running indicates guide vane position is < -1% or > 103%. Enter Quick Test and conduct Guide Vane Calibration. Check wiring between the guide vane feedback potentiometer and IOB terminals. Check the 10,000 ohm guide vane position feedback potentiometer or 4 to 20mA current.
Alm-268	ALM-268 Protective Limit — Damper Valve Fault	Manual	Unit shuts down.	Check damper valve wirings. Do a control test on the damper valve to check the feedback signals.
Alm-269	ALM-268 Protective Limit — HGBP Valve Fault	Manual	Unit shuts down.	Check HGBP valve wirings. Do a control test on the HGBP valve to check the feedback signals.
Alm-270	ALM-270 Protective Limit — High Cond Water Flow	Manual	Unit shuts down.	Check condenser water pressure sensor and wirings.
Alm-271	ALM-271 Protective Limit — Emergency Stop	Automatic	Unit shuts down.	Check EMSTOP command from network and the remote stop dry contact from IOB.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PROTECTIVE LIMITS (CONT)				
Alm-272	ALM-272 Protective Limit — ISM Config Conflict	Automatic	Unit shuts down.	Configuration data in controller and ISM are mismatched. In Maintenance menu, choose Maintains ISM config→Delete ISM config: NO - Upload ISM configuration data to HMI YES- Download ISM configuration to ISM
Alm-273	ALM-273 Protective Limit — VFD Speed Config Conflict	Manual	Unit shuts down.	Check VFD speed configurations in CONF_VFD screen.
Alm-274	ALM-274 Protective Limit — Chiller Lockout	Automatic	Unit shuts down.	Check chiller lockout input in IOB
Alm-275	ALM-275 Protective Limit — Fire Alarm	Automatic	Unit shuts down.	Check fire alarm input in IOB
Alm-276	ALM-276 Protective Limit — Stop Override	Manual	Unit shuts down.	Check stop override point status in GENUNIT table
LOSS OF COMMUNICATION WITH SLAVE BOARDS				
Alm-300	ALM-300 Loss of Communication — ISM	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-301	ALM-301 Loss of Communication — IOB 1	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-302	ALM-302 Loss of Communication — IOB 2	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-303	ALM-303 Loss of Communication — IOB 3	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-304	ALM-304 Loss of Communication — IOB 4	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-305	ALM-305 Loss of Communication — IOB 5	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-306	ALM-306 Loss of Communication — IOB 6	Automatic when communication returns to normal	Unit shuts down.	Check LEN communication cable. Check the wiring and termination resistor settings.
Alm-307	ALM-307 LEN Scan Error	Manual	Unit shuts down.	Check LEN bus hardware physical wiring and software log

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
INTEGRATED STARTER MODULE ALARMS				
Alm-400	ALM-400 ISM Fault — Line Voltage Dropout	Manual	Unit shuts down.	Temporary loss of voltage. SINGLE CYCLE DROPOUT in the ISM_CONF screen is Enabled and two LINE VOLTAGES < 50% MOTOR RATED LINE VOLTAGE. Check ISM_HIST screen. Disable Single Cycle Dropout in VFD_CONF screen. Check ISM Status under the Maintenance Menu.
Alm-401	ALM-401 ISM Fault — Line Phase Loss	Manual	Unit shuts down.	Any LINE VOLTAGE < 50% MOTOR RATED LINE VOLTAGE, or there is an excessive difference between the smallest LINE CURRENT and the largest LINE CURRENT. Check the ISM_HIST screen. Check MOTOR RATED LINE VOLTAGE in ISM_CONF screen. Check phase to phase and phase to ground power distribution bus voltage. Check current transformer wiring leading to ISM terminal block J4 and line voltage wiring leading to ISM terminal block J3. Check wiring and hardware between building power supply and motor. Current imbalance may improve if power or motor leads are rotated in the same phase sequence. Consult power company. Medium voltage applications only: Check voltage potential transformers and VOLT TRANSFORMER RATIO in ISM_CONF screen. Check ISM Status under the Maintenance Menu.
Alm-402	ALM-402 ISM Fault — High Line Voltage	Manual	Unit shuts down.	High LINE VOLTAGE for an excessive amount of time. Check LINE VOLTAGE in ISM_HIST screen. Check MOTOR RATED LINE VOLTAGE and OVERVOLTAGE THRESHOLD in ISM_CONF screen. Check phase to phase and phase to ground distribution bus voltage. Consult power company. Medium voltage applications only: Check voltage potential transformers and VOLT TRANSFORMER RATIO in ISM_CONF screen. Check wiring to ISM J3-VL1, J3-VL2 and J3-VL3. Check ISM Status under the Maintenance Menu.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
INTEGRATED STARTER MODULE ALARMS (CONT)				
Alm-403	ALM-403 ISM Fault — Low Line Voltage	Manual	Unit shuts down.	Low LINE VOLTAGE for an excessive amount of time. Check LINE VOLTAGE in ISM_HIST screen. Check MOTOR RATED LINE VOLTAGE and UNDERVOLTAGE THRESHOLD in ISM_CONF screen. Check phase to phase and phase to ground distribution bus voltage. Check connections to ISM terminal block J3. Consult power company. Medium voltage applications only: Check voltage potential transformers and VOLT TRANSFORMER RATIO in ISM_CONF screen. Check wiring to ISM J3-VL1, J3-VL2 and J3-VL3. Check ISM Status under the Maintenance Menu.
Alm-404	ALM-404 ISM Fault — Line Current Imbalance	Manual	Unit shuts down.	Current imbalance > CURRENT % IMBALANCE for greater than the CURRENT IMBALANCE TIME. Check settings in ISM_CONF screen. Check ISM_HIST screen. Check current transformer wiring leading to ISM terminal block J4. Verify phase to phase and phase to ground line voltage. Check wiring and hardware between building power supply and motor. Current imbalance may improve if power or motor leads are rotated in the same phase sequence. Check ISM Status under the Maintenance Menu.
Alm-405	ALM-405 ISM Fault — Line Voltage Imbalance	Manual	Unit shuts down.	Voltage Imbalance > VOLTAGE % IMBALANCE for greater than the VOLTAGE IMBALANCE TIME. Check settings in ISM_CONF screen. Check ISM_HIST screen. Check line voltage wiring leading to ISM terminal block J3. Verify phase to phase and phase to ground line voltage. Check wiring and hardware between building power supply and motor. Check ISM Status under the Maintenance Menu.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
INTEGRATED STARTER MODULE ALARMS (CONT)				
Alm-406	ALM-406 ISM Fault — Overload Trip	Manual	Unit shuts down.	Any phase current > 108% RLA for excessive time period. Alarm can result from significant load side current imbalance when running at full load. Check ISM_HIST screen. Check for consistent entering condenser water temperature and water flow rates. Check MOTOR RATED LOAD AMPS and STARTER LRA RATING in ISM_CONF screen. VFD applications only: Any phase current > 120% for excessive time period. Check ISM Status under the Maintenance Menu.
Alm-407	ALM-407 ISM Fault — Motor Locked Rotor Trip	Manual	Unit shuts down.	Any LINE CURRENT > MOTOR LOCKED ROTOR TRIP for excessive time while running after the LOCKED ROTOR START DELAY has expired. Check MOTOR LOCKED ROTOR TRIP and MOTOR CURRENT CT RATIO in ISM_CONF screen. Check motor nameplate data. Check ISM_HIST screen. Check motor wiring and motor winding resistance. Temporarily enable SINGLE CYCLE DROP OUT to capture power disturbances. Check ISM Status under the Maintenance Menu.
Alm-408	ALM-408 ISM Fault — Starter Lock Rotor Trip	Manual	Unit shuts down.	Any LINE CURRENT > MOTOR LOCKED ROTOR TRIP for excessive time while running after the LOCKED ROTOR START DELAY has expired. Check MOTOR LOCKED ROTOR TRIP and MOTOR CURRENT CT RATIO in ISM_CONF screen. Check motor nameplate data. Check ISM_HIST screen. Check motor wiring and motor winding resistance. Temporarily enable SINGLE CYCLE DROP OUT to capture power disturbances. Check ISM Status under the Maintenance Menu.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
INTEGRATED STARTER MODULE ALARMS (CONT)				
Alm-409	ALM-409 ISM Fault — Ground Fault	Manual	Unit shuts down.	Any GROUND FAULT current > GROUND FAULT CURRENT threshold for a duration > GROUND FAULT PERSISTENCE after the GROUND FAULT START DELAY has expired. Check these settings and GROUND FAULT CT RATIO in ISM_CONF screen. Check ISM_HIST screen. Confirm that ground fault current transformer orientation is correct, and that the correct motor leads have been routed through the ground fault current transformers in the right direction. Check for condensation on motor terminals or inside motor leads. Check motor power leads for phase to phase or phase to ground shorts. Disconnect motor from starter and merger motor windings to ground and phase to phase. Call Carrier Service. Check ISM Status under the Maintenance Menu.
Alm-410	ALM-410 ISM Fault — Phase Reversal Trip	Manual	Unit shuts down.	The ISM has detected that the input power is phased BAC instead of ABC. Confirm that the phase sequence wired to ISM terminal block J3 is consistent with the power wiring to the starter. Swap two power leads at the starter. Check ISM Status under the Maintenance Menu.
Alm-411	ALM-411 ISM Fault — Line Frequency Trip	Manual	Unit shuts down.	LINE FREQUENCY FAULTING in ISM_CONF screen is enabled and the LINE FREQUENCY has deviated approximately 7% from nominal value. Check ISM_HIST screen. Check FREQUENCY = 60 HZ? in ISM_CONF screen. Check line frequency. If operating from a generator, check generator size and speed. Check ISM Status under the Maintenance Menu.
Alm-412	ALM-412 ISM Fault — Starter Module Reset	Manual	Unit shuts down.	AUTO RESTART OPTION in OPTIONS screen is disabled and there was a temporary loss of 115 v ISM control voltage supply. Check ISM_HIST screen. Check wiring leading to ISM terminals J1-LL1 and J1-LL2. Check control power circuit breaker, control power transformer and control power circuit fuses. Monitor chiller utility power for disruptions. Improve ISM ground connection; apply measures to reduce electrical noise to ISM. Consult power company. Check ISM Status under the Maintenance Menu.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
INTEGRATED STARTER MODULE ALARMS (CONT)				
Alm-413	ALM-413 ISM Fault — Start Contact Fault	Manual	Unit shuts down.	Check 1M dry contact input.
Alm-414	ALM-414 ISM Fault — Transition Contact Fault	Manual	Unit shuts down.	Check 2M dry contact input.
Alm-415	ALM-415 ISM Fault — High Condenser Pressure	Manual	Unit shuts down.	Check high pressure switch.
Alm-416	ALM-416 ISM Fault — Starter Fault	Manual	Unit shuts down.	The ISM has received a start command and the starter has declared a Fault. The dry contacts connected to ISM J2-7 and J2-8 are open. See starter display for starter Fault Code. For Benshaw Inc. RediStart starters, view RediStart MICRO display. For VFD, check VFD display Fault History. Clear VFD faults with VFD keypad. For Allen-Bradley wye delta starters with RLA > 718 A, the TR3 timer may have expired as a result of a delayed transition.
Alm-417	ALM-417 ISM Fault — Motor Amps Not Sensed	Manual	Unit shuts down.	The ISM has not sensed sufficient current for an excessive delay after 1M has closed. Check ISM_HIST screen Check the MOTOR CURRENT CT RATIO and the MOTOR RATED LOAD AMPS in the ISM_CONF screen. Check VFD OPTION configuration. Check for wiring of current transformers to the J4 ISM terminals. Check if main circuit breaker has tripped. Check ISM Status under the Maintenance Menu.
Alm-418	ALM-418 ISM Fault — Excessive Acceleration Time	Manual	Unit shuts down.	Any line current remains high for an excessive time duration following 1M aux and either 2M aux or transition contact closure. Check that inlet guide vanes are fully closed at start up. Check ISM_HIST screen. Check Motor Rated Load Amps in ISM_CONF screen. Reduce condenser pressure if possible. Check ISM Status under the Maintenance Menu.

Table 15 — PIC 5 Alarm Codes (cont)

ALARM CODE (ALARMRST)	ALARM TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
INTEGRATED STARTER MODULE ALARMS (CONT)				
Alm-419	ALM-419 ISM Fault — Excessive Motor Amps	Manual	Unit shuts down.	AVERAGE LINE CURRENT > 110% for an excessive amount of time. Check MOTOR RATED LOAD AMPS and MOTOR CURRENT CT RATIO in ISM_CONF time. Check ISM_HIST screen. Check for conditions that cause excessive lift. Check guide vane actuator for proper operation. Confirm that guide vanes will fully close prior to start-up. Check ISM Status under the Maintenance Menu.
Alm-420	ALM-420 ISM Fault — Start Transition Contact Failure	Manual	Unit shuts down.	Check 1M and 2M dry contact inputs
Alm-421	ALM-421 ISM Fault — Motor Amps When Stopped	Manual	Unit shuts down.	High line current measured on any phase after power up or STOP command. Check the MOTOR CURRENT CT RATIO and the MOTOR RATED LOAD AMPS in the ISM_CONF screen. Check VFD OPTION in SETUP 2 screen. Check ISM_HIST screen. Check for high inrush current during power-up. Confirm that the starter de-energizes the motor when the ISM removes 115 v from ISM J9-2. Confirm that the correct STARTER TYPE has been selected in the ISM_CONF screen. Check ISM Status under the Maintenance Menu.
Alm-422	ALM-422 ISM Fault — Starter Module Failure	Manual	Unit shuts down.	Check ISM Hardware
Alm-423	ALM-423 ISM Fault — Calibration Factor Error	Manual	Unit shuts down.	Check ISM Calibration Values
Alm-424	ALM-424 ISM Fault — Invalid Configuration Error	Manual	Unit shuts down.	Check ISM Configurations

Table 16 — PIC 5 Alert Codes

ALERT CODE (ALARMRST)	ALERT TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PRESTART ALERTS				
Alt-100	ALT-100 Prestart Alert — Starts Limit Exceeded	Automatic when the situation returns to normal	Turn on Alert relay.	Check STARTS IN 12 HOURS in Run times screen. Enable “Enable Excessive Starts” option in Service menu if additional start is required. NOTE: Recycle restarts and auto restarts after power failure are not counted in Starts Limit.
Alt-101	ALT-101 Prestart Alert — Low Oil Temperature	Automatic when the situation returns to normal	Alert relay is ON.	Check OIL SUMP TEMP in default screen. Check oil heater contactor/relay and power. Check oil sump temperature sensor wiring and accuracy. Check oil level and oil pump operation. Check EVAP SAT TEMP.
Alt-102	ALT-102 Prestart Alert — High Condenser Pressure	Automatic when the situation returns to normal	Alert relay is ON.	Check CONDENSER PRESSURE. Check condenser pressure transducer wiring and accuracy. Check for high condenser water temperatures. Check COND PRESS OVERRIDE in configuration.
Alt-103	ALT-103 Prestart Alert — Excessive Recycle Starts	Automatic when the situation returns to normal	Alert relay is ON.	Chiller load is too low to keep compressor on line and there have been more than 5 starts in 4 hours. Increase chiller load, adjust hot gas bypass to open at a higher load, increase recycle RESTART DELTA T in service menu. Check hot gas bypass isolation valve position.
SENSOR ALERTS				
Alt-120	Alt-120 Sensor Alert — Remote Temperature Out of Range	Automatic when the situation returns to normal	Alert relay is ON.	Type 2 Temperature Reset is Enabled and remote temperature reset sensor is out of range. Check ENABLE RESET TYPE and TEMPERATURE RESET settings in TEMP_CNTL screen. Check remote temperature reset sensor resistance or voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations and SW2 dip switch setting in IOB.
Alt-121	Alt-121 Sensor Alert — Auto Water Temp Reset	Automatic when the situation returns to normal	Alert relay is ON.	Check sensor resistance or voltage drop. Check for proper wiring. Check for proper wiring to IOB. Check IOB channel type configurations and SW2 dip switch setting in IOB.

Table 16 — PIC 5 Alert Codes (cont)

ALERT CODE (ALARMRST)	ALERT TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
SENSOR ALERTS (CONT)				
Alt-122	Alt-122 Sensor Alert — Auto Demand Limit Input	Automatic when the situation returns to normal	Alert relay is ON.	20 mA DEMAND LIMIT OPT is Enabled, Ice Build is not Active, and Auto Demand Limit Input on IOB is < 2 mA. Check 20 mA DEMAND LIMIT OPT and DEMAND LIMIT AT 20 mA in Service screen. Confirm that Auto Demand Limit Input is between 4 mA and 20 mA. Check IOB channel type configurations and SW2 dip switch setting in IOB.
Alt-123	Alt-123 Sensor Alert — VFD Speed Out of Range	Automatic when the situation returns to normal	Alert relay is ON.	Check VFD speed feedback input in ISM
Alt-124	Alt-124 Sensor Alert — Humidity Sensor	Automatic when the situation returns to normal	Alert relay is ON.	Check humidity sensor input in IOB
Alt-125	Alt-125 Sensor Alert — Refrigerant Leak Input	Automatic when the situation returns to normal	Alert relay is ON.	Check refrigerant leak optional input in IOB
Alt-127	Alt-127 Sensor Alert — High Chilled Water Pressure	Automatic when the situation returns to normal	Alert relay is ON.	Check optional evaporator water pressure sensor. Check evaporator water flow.
Alt-128	Alt-128 Sensor Alert — High Cond Water Pressure	Automatic when the situation returns to normal	Alert relay is ON.	Check optional condenser water pressure sensor. Check condenser water flow.
Alt-129	Alt-129 Sensor Alert — Leaving Cond Water Temp	Automatic when the situation returns to normal	Alert relay is ON.	Leaving condenser water temperature sensor reading is out of range. Check leaving condenser water sensor resistance or voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations.
Alt-130	ALT-130 Sensor Alert — Entering Cond Water Temp	Automatic when the situation returns to normal	Alert relay is ON.	Entering condenser water temperature sensor reading is out of range. Check entering condenser water sensor resistance or voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations.
Alt-131	ALT-131 Sensor Alert — Entering Cond Water Press	Automatic when the situation returns to normal	Alert relay is ON.	Check entering condenser water pressure sensor voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations.
Alt-132	ALT-132 Sensor Alert — Entering Chilled Water Press	Automatic when the situation returns to normal	Alert relay is ON.	Check entering chilled water pressure sensor voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations.
Alt-133	ALT-133 Sensor Alert — Leaving Cond Water Press	Automatic when the situation returns to normal	Alert relay is ON.	Check leaving condenser water pressure sensor voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations.
Alt-134	ALT-134 Sensor Alert — Leaving Chilled Water Press	Automatic when the situation returns to normal	Alert relay is ON.	Check leaving chilled water pressure sensor voltage drop. Check for proper wiring to IOB. Check IOB channel type configurations.

Table 16 — PIC 5 Alert Codes (cont)

ALERT CODE (ALARMRST)	ALERT TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
SENSOR ALERTS (CONT)				
Alt-135	ALT-135 Sensor Alert — GuideVane Position	Automatic when the situation returns to normal	Alert relay is ON.	Check guide vane position feedback. Check guide vane actuator wiring.
Alt-136	ALT-136 Configuration Error — Temp Reset	Automatic when the situation returns to normal	Alert relay is ON.	Check temperature reset configurations.
Alt-137	ALT-137 Configuration Error — Controlled Water Delta T Reset	Automatic when the situation returns to normal	Alert relay is ON.	Check controlled water temperature reset configurations.
Alt-138	ALT-138 Configuration Error — Head Pressure	Automatic when the situation returns to normal	Alert relay is ON.	Check head pressure configurations.
PROCESS ALERTS				
Alt-150	ALT-150 Process Alert — Low Discharge Superheat	Automatic when the situation returns to normal	Alert relay is ON.	Check for oil loss from compressor or excess oil charge. Check for excess refrigerant charge. Verify that the valves in the oil reclaim lines are open. Check oil reclaim strainers. Check actual SUPERHEAT in Temperature screen.
Alt-151	ALT-151 Process Alert — High Evaporator Approach	Automatic when the situation returns to normal	Alert relay is ON.	Check EVAP APPROACH ALERT setting. Check Evaporator Water Flow. Check evaporator refrigerant liquid temperature and leaving chilled water temperature sensor resistances and voltage drop. Check evaporator refrigerant liquid temperature and leaving chilled water temperature sensor wiring to the IOB terminal block. Check for oil loss or low refrigerant charge. Check oil reclaim line isolation valves and strainers. Confirm that the optional refrigerant liquid line isolation valve is open. Check for float valve operation and for refrigerant stacking in the condenser. Check chilled water valves and strainers. Check for air in the evaporator water box or division plate bypass. Check for fouled tubes. Confirm that the oil reclaim system is working. Take oil sample and check for mineral oil contamination. Check for 20° F (11° C) temperature difference between leaving chilled water and leaving condenser water.

Table 16 — PIC 5 Alert Codes (cont)

ALERT CODE (ALARMRST)	ALERT TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
PROCESS ALERTS (CONT)				
Alt-152	ALT-152 Process Alert — High Condenser Approach	Automatic when the situation returns to normal	Alert relay is ON.	Check COND APPROACH ALERT setting. Check Condenser Water Flow. Check condenser pressure transducer and leaving condenser water temperature sensor resistance or voltage drop. Check condenser shell temperature against condenser pressure measured with a refrigerant gage for evidence of noncondensables in refrigerant charge. Check for condenser water box division plate bypass. Check condenser pressure transducer and leaving condenser water sensor wiring to the CCM. Check for air in the condenser water box. Confirm that the condenser tubes are not fouled.
Alt-153	ALT-153 Process Alert — High Noise Region	Automatic when the situation returns to normal	Alert relay is ON.	Check the envelope control configurations and running conditions. Check HGBP valve action.
Alt-154	ALT-154 Process Alert — Damper Valve Alert	Automatic when the situation returns to normal	Alert relay is ON.	Check damper valve wiring and position feedback inputs
Alt-155	ALT-155 Process Alert — Low Oil Pressure Difference	Automatic when the situation returns to normal	Alert relay is ON.	Check oil pump wiring and oil filter Quick test oil pump as necessary
Alt-156	ALT-156 Process Alert — HGBP Valve Alert	Automatic when the situation returns to normal	Alert relay is ON.	Check HGBP valve wiring and feedback inputs
Alt-157	ALT-157 Process Alert — High Condenser Pressure Chiller Off	Automatic when the situation returns to normal	Alert relay is ON.	Check condenser pressure sensor input, and check condenser pressure override configurations
Alt-158	ALT-158 Process Alert — Compressor Start Relay Stop Failure	Manual	Alert relay is ON.	Check motor starter start contactor and current input in ISM
Alt-159	ALT-159 Process Alert — LEN Scan Warnning	Manual	Alert relay is ON.	Check LEN bus traffic with bus monitor
Alt-160	ALT-160 Process Alert — Oil Filter Replacement	Manual	Alert relay is ON.	Check oil filter
Alt-161	ALT-161 Process Alert — Transducer Calibration	Manual	Alert relay is ON.	Do the indicated transducer calibration
Alt-162	ALT-162 Process Alert — Low Refrigerant Charge	Manual	Alert relay is ON.	Confirm that the unit has low refrigerant charge before adding refrigerant into chiller.

Table 16 — PIC 5 Alert Codes (cont)

ALERT CODE (ALARMRST)	ALERT TEXT DESCRIPTION	RESET TYPE	ACTION TAKEN BY CONTROL	POSSIBLE CAUSE
MASTER/SLAVE ALERTS				
Alt-170	ALT-170 Master/Slave Alert — Master Slave Same Address	Manual	Master slave work independent	Check master slave address configurations
Alt-171	ALT-171 Master/Slave Alert — Conflict SW Version	Manual	Master slave work independent	Check master slave software version number
Alt-172	ALT-172 Master/Slave Alert — Conflict Cooling Heating Mode	Manual	Master slave work independent	Check master slave cooling heating selection
Alt-173	ALT-173 Master/Slave Alert — Incorrect Slave Control Type	Manual	Master slave work independent	Check slave control type
Alt-174	ALT-174 Master/Slave Alert — Slave Tripout	Manual	Master slave work independent	Check slave chiller alarms
Alt-175	ALT-175 Master/Slave Alert — Incorrect Master Control Typr	Manual	Master slave work independent	Check master control type
Alt-176	ALT-176 Master/Slave Alert — No Communication Master / Slave	Automatic	Master slave work independent	Check communication between master and slave, wiring, etc.
Alt-179	ALT-179 Master/Slave Alert — Master CCN Write Rejection	Manual	Master slave work independent	Check CCN communication, hardware and software
Alt-180	ALT-180 Master/Slave Alert — Address Not Slave	Manual	Master slave work independent	Check master slave configurations

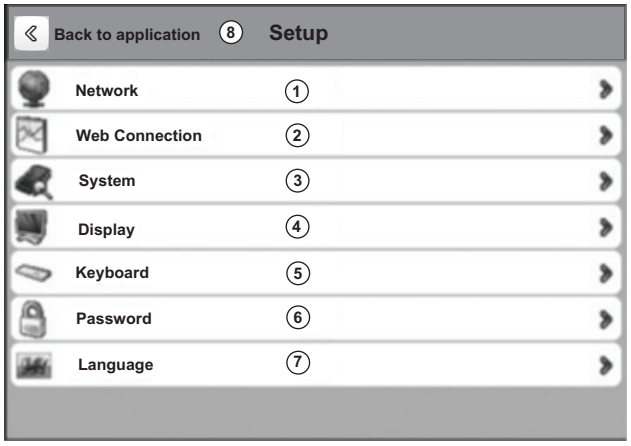
Event States — An event state is a specific set of conditiosn that the controller may encounter when controlling the chiller. Event states are repeatable, predictable, and represent known states of the control. If the control is in a particular state. a unique message is associated with that state. The event state messages are displayed on the default screen of the control panel and are listed in Table 17 below.

Table 17 — Event States

EVENT NO.	DESCRIPTION
1	Chiller Off
2	Chiller Tripout
3	Pumpdown Lockout
4	Terminate Pumpdown Lockout
5	Guide Vane Calibration
6	Quick Test in Progress
7	Ice Build Done
8	Ice Build In Progress
10	Auto Restart Pending
20	Startup Inhibited — Loadshed in Effect
21	Prestart Check in Progress
22	Timeout — Start Delay in Progress
23	Recycle in Progress
24	Startup in Progress
25	Swift Restart In Progress
30	Ramp Loading — Temperature
31	Ramp Loading — Motor Load
32	Ramp Loading — Capacity Inhibit
39	Demand Limit — Capacity Inhibit
40	Demand Limit — Capacity Decrease
41	Demand Limit — Inhibit Clamp
45	Override — High Condenser Pressure
47	Override — High Motor Temperature
48	Override — Low Evap Refrig Temp
50	Override — High Bearing Temp
51	Override — Low Discharge Superheat
52	Override — Manual VFD Speed Target
53	Override — High Motor Current
54	Override — High Discharge Temp
55	Override — Low Source Temp
60	Running — Temp Reset by 4-20 mA Signal
61	Running — Temp Reset by Remote Temp Sensor
62	Running — Temp Reset by Water DT
63	Running — Cooling Leaving Chilled Water
64	Running — Cooling Entering Chilled Water
65	Running — Heating Leaving Cond Water
66	Running — Heating Entering Cond Water
67	HGBP — Surge Correction
68	HGBP — Acts Before Recycle Shutdown
69	HGBP — Low Load Application
70	HGBP — Forced
71	Running — VFD Rampdown
72	Running — Guide Vane Position Forced
73	Running — VFD Speed Forced
74	Surge Prevention — Low
75	Surge Prevention — High
90	Shutdown — Normal
91	Shutdown — Alarm
93	Shutdown — Recycle
94	Shutdown — Recycle Ice Build
95	Shutdown — Compressor Deenergized

TOUCH SCREEN SETTINGS FOR THE CONTROLLER

The Setup screen is accessible only from the controller touch screen, and is not password-protected by default. To access the Setup display, press anywhere on the screen (except on buttons or text fields) for 4 seconds. The Setup screen is displayed. See Fig. 49.



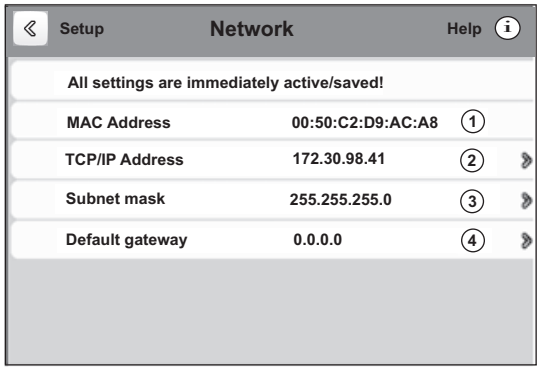
LEGEND

1 — Network: System properties for Ethernet interface
2 — Web Connection: Configuration for web-based welcome page
3 — System: Software version, buzzer
4 — Display: Settings such as contrast, backlighting
5 — Keyboard: Not applicable
6 — Password: For Setup menu access only
7 — Language: Display for Setup menu only
8 — Return to application

Fig. 49 — Setup Screen

Unit IP Address — On the Setup screen, press Network to display the network parameters. See Fig. 50.

NOTE: You must request an IP address, the subnet mask, and the default gateway from the system administrator before connecting the unit to the local Ethernet network.



LEGEND

1 — MAC address (read-only)
2 — IP address
3 — Subnet mask
4 — Default gateway

Fig. 50 — Network Screen

Press TCP/IP Address to display the TCP/IP Address screen. See Fig. 51.

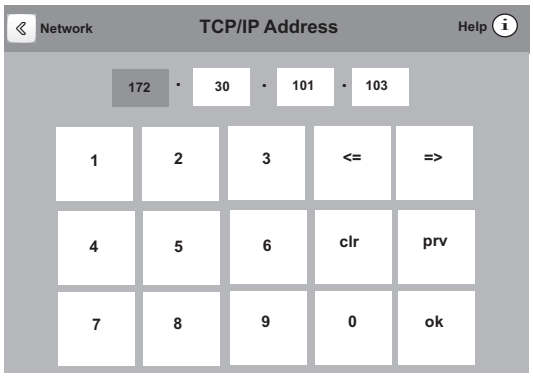


Fig. 51 — TCP/IP Address Screen

Enter the new address and validate it by pressing OK. Return to the Network screen and enter the subnet mask and default gateway using the same method. Then return to the application and save the changes. See Fig. 52.

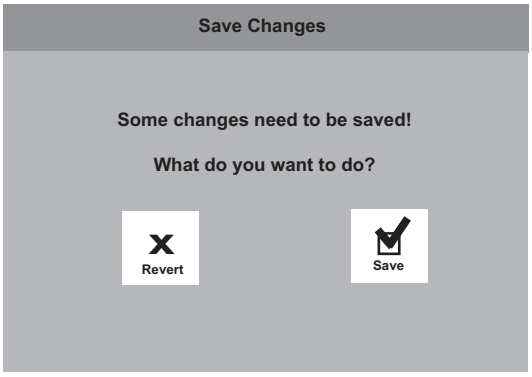
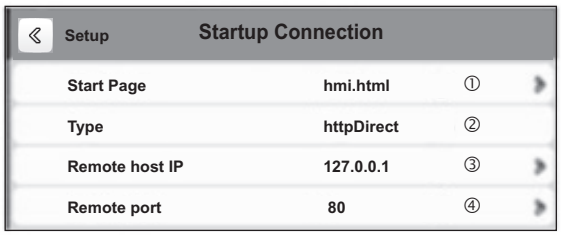


Fig. 52 — Save Changes

Web Address — This configuration is normally done at the factory and is not typically modified in the field. To check the parameters, on the Setup screen, press Web Connection to display the web parameters. The Startup Connection screen is displayed. See Fig. 53.

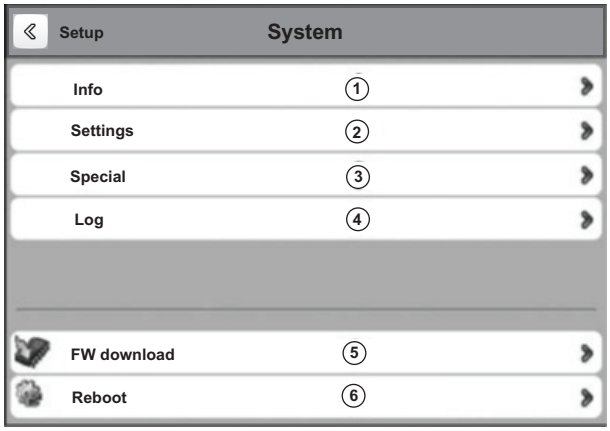


LEGEND

1 — Start page: hmi.html
2 — Type: httpDirect; not modifiable
3 — Remote host IP: not applicable. Do not modify.
4 — Remote port: not applicable. Do not modify.

Fig. 53 — Startup Connection

System Information, Buzzer Parameters, and Welcome Screen Content — On the main Setup screen (see Touch Screen Settings for the Controller on page 52), press System. The System screen is displayed. See Fig. 54.

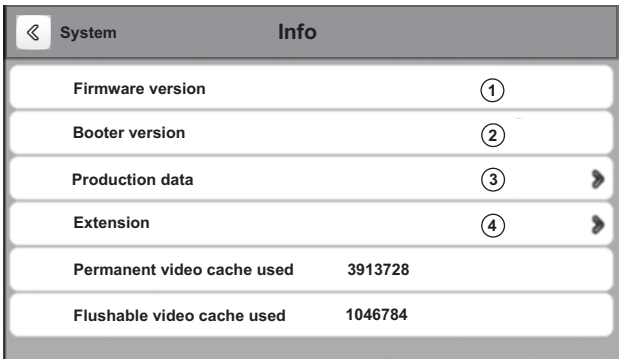


LEGEND

1 — Info: Software version
2 — Settings: Buzzer settings, information on Welcome screen
3 — Special: Reset to 0, flash formatting, clock parameters. Do not modify.
4 — Log: Unit start-up history
5 — Firmware update (not applicable)
6 — Unit reboot

Fig. 54 — System Screen

Press Info on the System screen to display the software version and unit serial number. See Fig. 55.

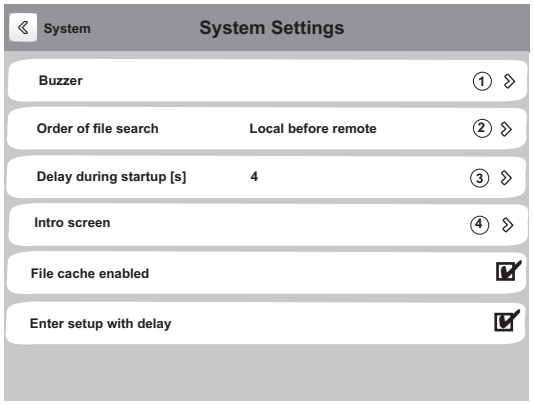


LEGEND

1 — Firmware version that loaded this software
2 — Boot loader version that loaded this software
3 — Software production data
4 — Extended hardware details

Fig. 55 — System Information

On the System screen, press Settings to display the System Settings screen. See Fig. 56.

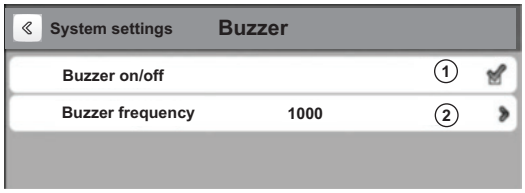


LEGEND

1 — Buzzer: Buzzer configuration
2 — Order of file search: Local before remote. Do not modify.
3 — Delay during startup(s): 4. Do not modify.
4 — Intro screen: Information on the system start-up screen.

Fig. 56 — System Settings

Press Buzzer to display or modify buzzer settings. See Fig. 57.



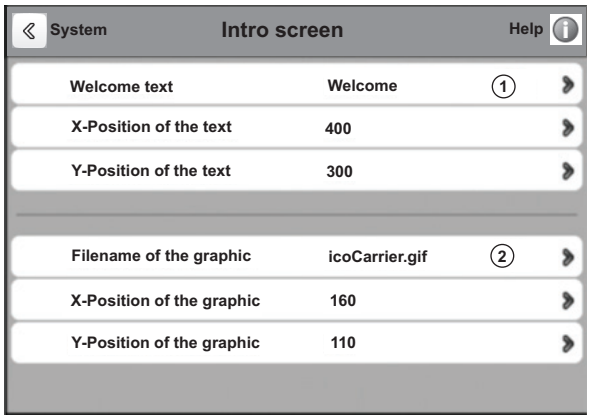
LEGEND

1 — Buzzer on/off
2 — Buzzer frequency configuration

Fig. 57 — Buzzer Settings

Press System Settings to return to the System Settings screen.

On the System Settings screen, press Intro screen to customize the Welcome screen (see the Welcome Screen section on page 17). See Fig. 58.

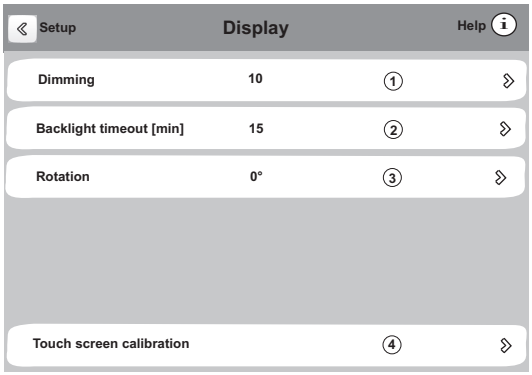


LEGEND

1 — Welcome message text; default: Welcome
2 — Filename of graphic; default: ico.Carrier.gif (Carrier logo)

Fig. 58 — Welcome Screen Settings

General Display Settings — To set contrast, screensaver, screen image rotation, and touch screen calibration, press Display on the Setup screen (see the section Touch Screen Settings for the Controller on page 52). The Display screen opens. See Fig. 59.



LEGEND

1 — Dimming: Contrast control
2 — Backlight timeout (min): Inactivity time until screensaver is displayed (screen goes black)
3 — Rotation: Rotation of screen image
4 — Touchscreen calibration

Fig. 59 — Display Settings

TOUCH SCREEN CALIBRATION — Depending on the user and the position of the panel, it may be necessary to calibrate the touch screen if the cursor does not move precisely with the user's touch. When the user presses Touch Screen Calibration, a white box with crosshairs appears on the display screen. Touch the center of the crosshair sight with a touch pen or similar blunt-ended stylus (do not use a metal object). When the crosshair sight is touched, it moves to a new position; touch the center of the crosshairs again. When all positions have been configured, the crosshairs disappear. Click on the now blank box on the display and check the precision of the setup (the cursor should move with the user's touch). This completes the calibration and the white box disappears.

Touch Screen Configuration Language — To set the language for touch screen configuration screens, press Language on the Setup screen (see the section Touch Screen Settings for the Controller on page 52). The Language screen offers the options shown in Fig. 60.

NOTE: The language selection on this screen controls only the display language for interface settings, not the language for the unit application. See User Login Screen on page 18 for instructions on setting the unit application language.

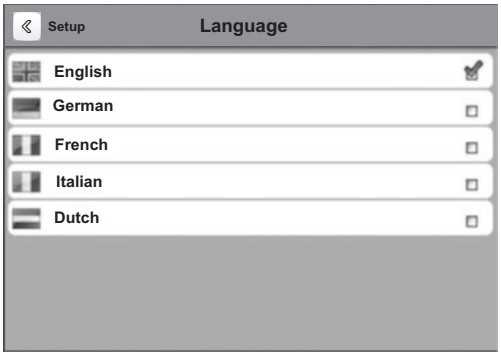


Fig. 60 — Touch Screen Configuration Language

COMMUNICATION PROBLEMS

Hardware Problems — See Table 18 for potential communication issues caused by hardware problems.

Web Interface Problems — See Table 19 for potential communication issues caused by web interface issues. The intranet site of the unit is the IP address (see Unit IP Address on page 52).

NOTE: The unit cannot automatically obtain the network parameters via a DHCP server.

Table 18 — Hardware Problems

SYMPTOMS	POSSIBLE CAUSES	CHECKS	SOLUTIONS
The unit does not respond to the instructions sent by the supervision PC on the CCN bus.	Problem at the RS485 converter level of the PC or connection problem on the primary CCN bus.	Check the CCN cable connections. The unit CCN address is 0.1 and the communication speed is 9600 baud by default.	Replace the RS485 connector.
Communication problem when connecting two buses (primary bus and secondary bus).	Electrical problem between 0 v CCN of the primary bus and 0 v CCN of the secondary bus.	Check the connection of the metal part of the interface casing to earth.	Connect the metal part of the interface casing to earth.

Table 19 — Web Interface Problems

SYMPTOMS	POSSIBLE CAUSES	CHECKS	SOLUTIONS
Start-up page loads, then goes to fault state.	Network property details are not valid. Ethernet network is not available.	Check the network parameters (see the section Ethernet/IP Connection Problems on page 56). Check to see if the orange LED on the unit is flashing.	Contact your system administrator. Check the Ethernet connection to the local network if the orange LED does not flash.
While accessing the unit via the web browser, the Java platform launches, but remains blocked. No file is loaded.	Proxy server problem in the local network.	Contact your system administrator.	In agreement with the system administrator, open the Runtime Java control panel and select Direct Connection in the system parameters and/or request in the web browser (Tools →Options→ Connection→ System parameters) that no proxy server is used to go to the local addresses. If possible, uncheck “use of an automatic configuration script.” Restart the web browser.
The application has been launched, but the screens are not shown in the web browser.	A proxy server is used to access the unit and this supplies the old screens to the browser. Incorrect configuration of the Java application.	Check that the web browser does not go via a proxy server to access the unit. Check that the Java application does not store the internet files on the PC.	Open the browser and in the system connection parameters add the IP address of the unit in the proxy exceptions. (Tools→Options →Connection→System parameters→“No proxy for”). See the section Java Application Configuration on page 57.

NOTES:
1. The unit cannot automatically obtain the network parameters via a DHCP (Dynamic Host Configuration Protocol) server.
2. The intranet site address of the unit is the IP address.

Ethernet/IP Connection Problems — Troubleshoot these with the following methods:

UNIT IS POINT-TO-POINT CONNECTED TO A PC — The cable can be either crossed or uncrossed, and the unit is energized.

NOTE: In addition to the following procedure, it may be necessary to check the Ethernet connection and/or configure the PC network board.

In Network Settings, open Local Area Connection Properties. Select Internet Protocol and click Properties. See Fig. 61.

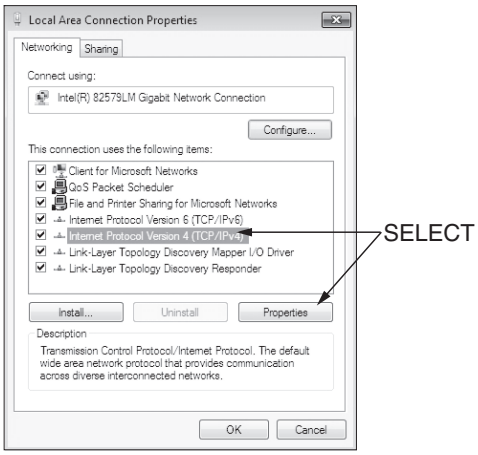


Fig. 61 — Local Area Connection Properties

The Internet Protocol Properties window is displayed.

- If no IP address is configured in the General and Alternative Configuration tabs, the unit IP address must be configured to 169.254.xxx.xxx. Modify the unit IP address and then restart the system.
- If the PC has a fixed IP address configured in one of the two tabs (General and Alternative Configuration), the IP address of the PC and the unit IP address must have the system and sub-system fields in common. The last part of the IP address is the host number and must be unique on the sub-system. For example: Unit address — 172.30.101.11 and PC address — 172.30.101.182. In this example, 172.30 corresponds to the network, and 101 corresponds to the sub-system. Carry out the necessary modifications and try to access the unit again.

If there is still a problem, open a Windows command window (Start, Execute, type **cmd** and press Enter), then type the command **ping**, followed by the unit IP address. In the example shown in Fig. 62, the PC receives four positive responses (replies).

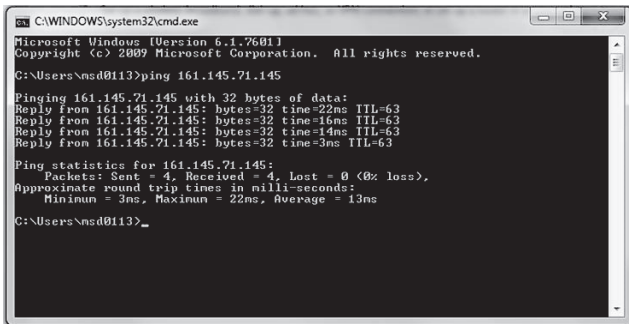


Fig. 62 — Ping — Positive Replies

In the example shown in Fig. 63, the PC receives four negative responses (request timed out).

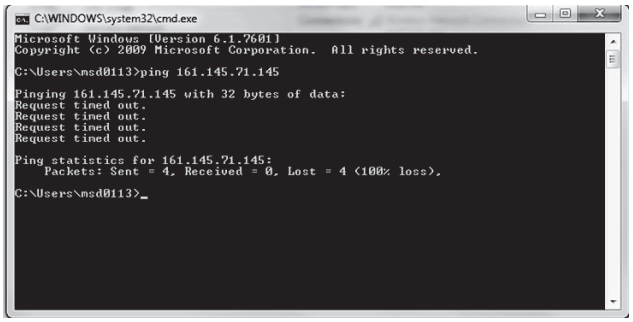


Fig. 63 — Ping — Negative Responses

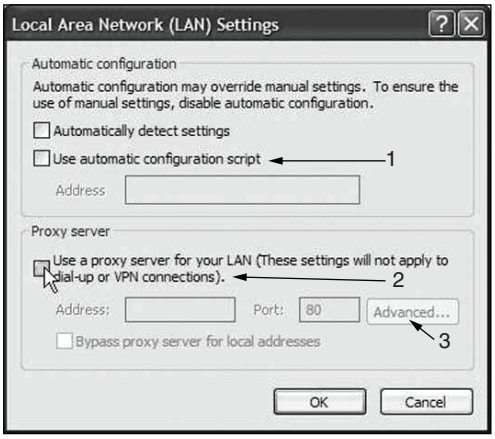
If the PC receives four negative responses, check the internet browser parameters to determine if a proxy server or an automatic configuration script has been configured. If this is the case:

- Deselect the proxy server or the configuration script and restart the browser,
- Or refer to the section Java Application Configuration (page 57).

Try to access the unit again. If the PC still does not receive a response from the unit, restart the unit. Contact your system administrator.

UNIT IS CONNECTED TO THE LOCAL NETWORK — The unit is connected to the local network by an uncrossed cable, and the unit is energized. Open a Windows command window (Start, Execute, type **cmd** and press Enter), then type the command **ping**, followed by the unit IP address.

If the responses are positive (see Fig. 62), the internet browser configuration is faulty. Check the system parameters of the internet browser to determine if a proxy server or an automatic configuration script has been configured (Tools→ Internet Options→ Connections→ System Parameters). See Fig. 64.



LEGEND

1 — Automatic configuration script
2 — Proxy server
3 — Advanced proxy configuration

Fig. 64 — Local Area Network Settings

If a proxy server is used, add the unit IP address to the exceptions list of the proxy server (advanced proxy configuration). See Fig. 65.

Fig. 65 — Proxy Settings

If a configuration script is used, it is not possible to add the unit IP address to the exceptions list. In this case, see the section Java Application Configuration below.

If the response to the "ping" command is negative, verify the IP address of the PC and the IP address of the unit. They must have the system network and sub-system in common. The last part of the IP address is the host number and must be unique on the sub-system; for example: Unit address — 172.30.101.11 and PC address — 172.30.101.182. In this example, 172.30 corresponds to the system network, and 101 corresponds to the sub-system. The host numbers are 11 and 182 respectively.

ETHERNET CONNECTION ON THE PC — Open the network configuration window of the PC and double-click Network Connections. Find the system interface board and check that no red "X" appears on the icon.

The connection to the local network must be authorized and in the connected status. If this is not the case, check the connections and authorize/repair the network connection.

JAVA APPLICATION CONFIGURATION — Open the Internet configuration window of the PC and double-click the Java application icon. If Java is not installed, a free download is available at http://www.java.com.

If Java has already been installed, check if it is used by other applications. If so, check that these are compatible with the following settings in the Java control panel. See Fig. 66.

Fig. 66 — Java Control Panel

- Network settings: In the Java Control Panel, click Network Settings. Select a direct connection to bypass the proxy server or select the automatic configuration script. See Fig 67.

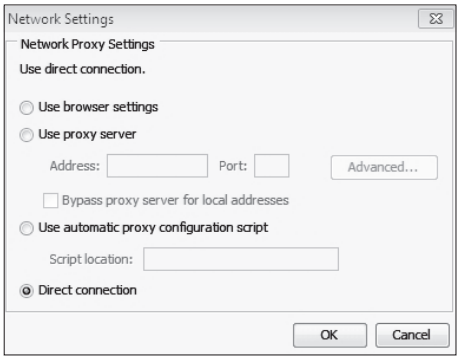


Fig. 67 — Network Settings

- Temporary internet files: In the Java Control Panel, click Settings in the Temporary Internet Files section. Be sure the setting Keep temporary files on my computer is unchecked (clear). See Fig. 68.

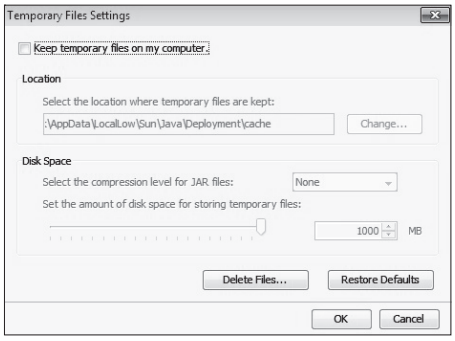


Fig. 68 — Temporary File Settings

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE

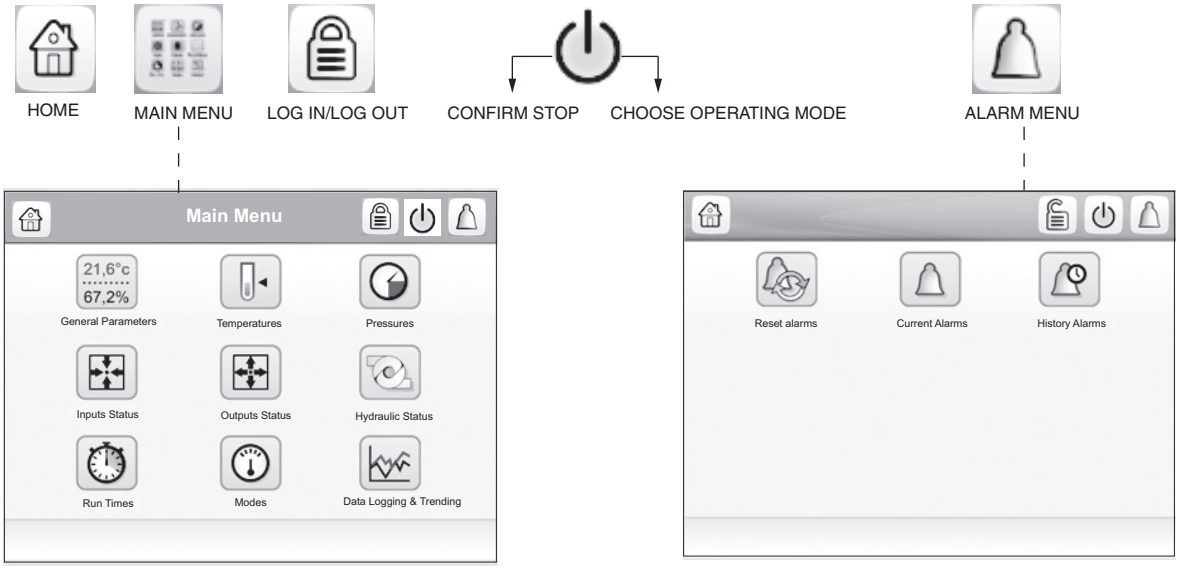


Fig. A — Screen Structure, Basic Level (All) Access (No Password Required)

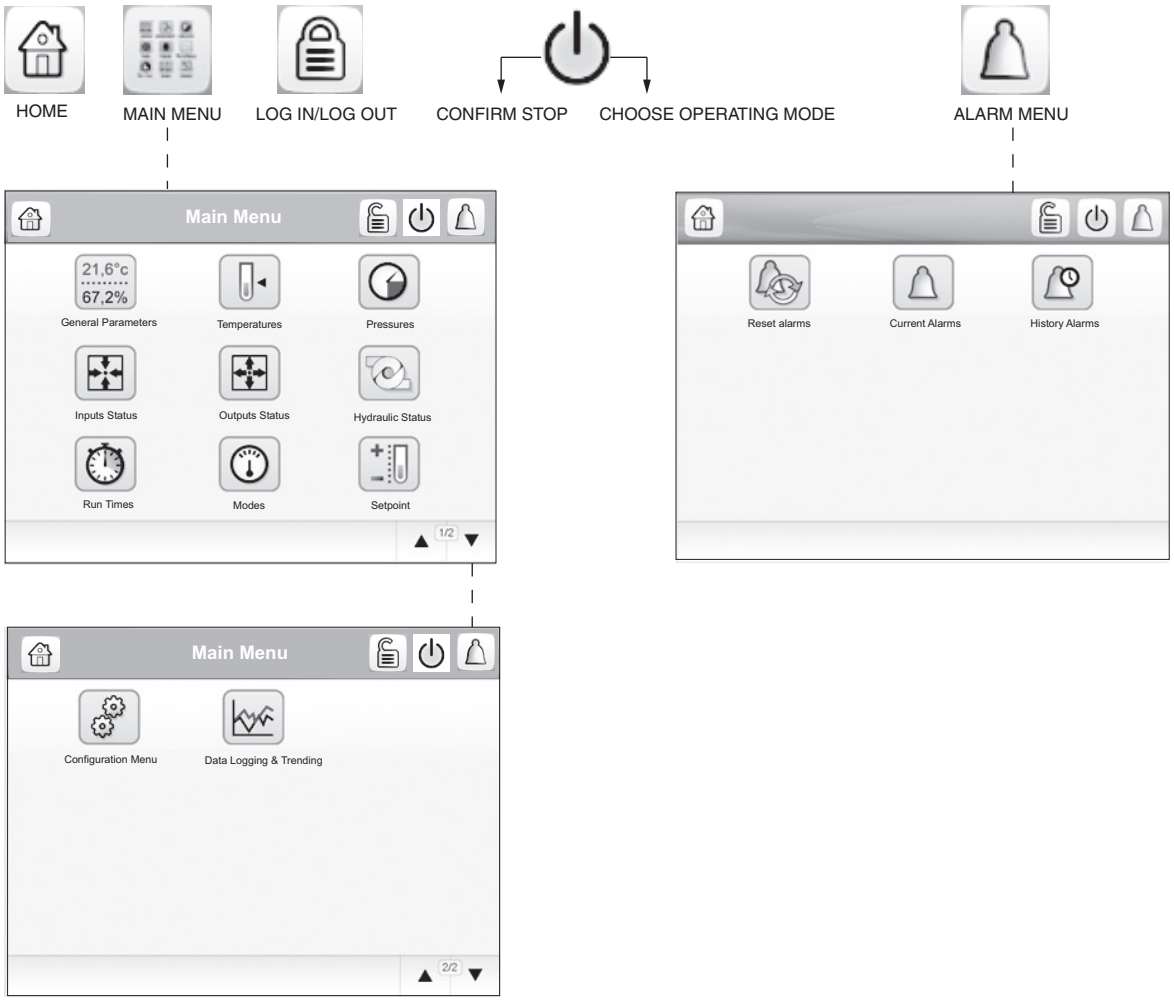


Fig. B — Screen Structure, User Level Access (User Password Required)

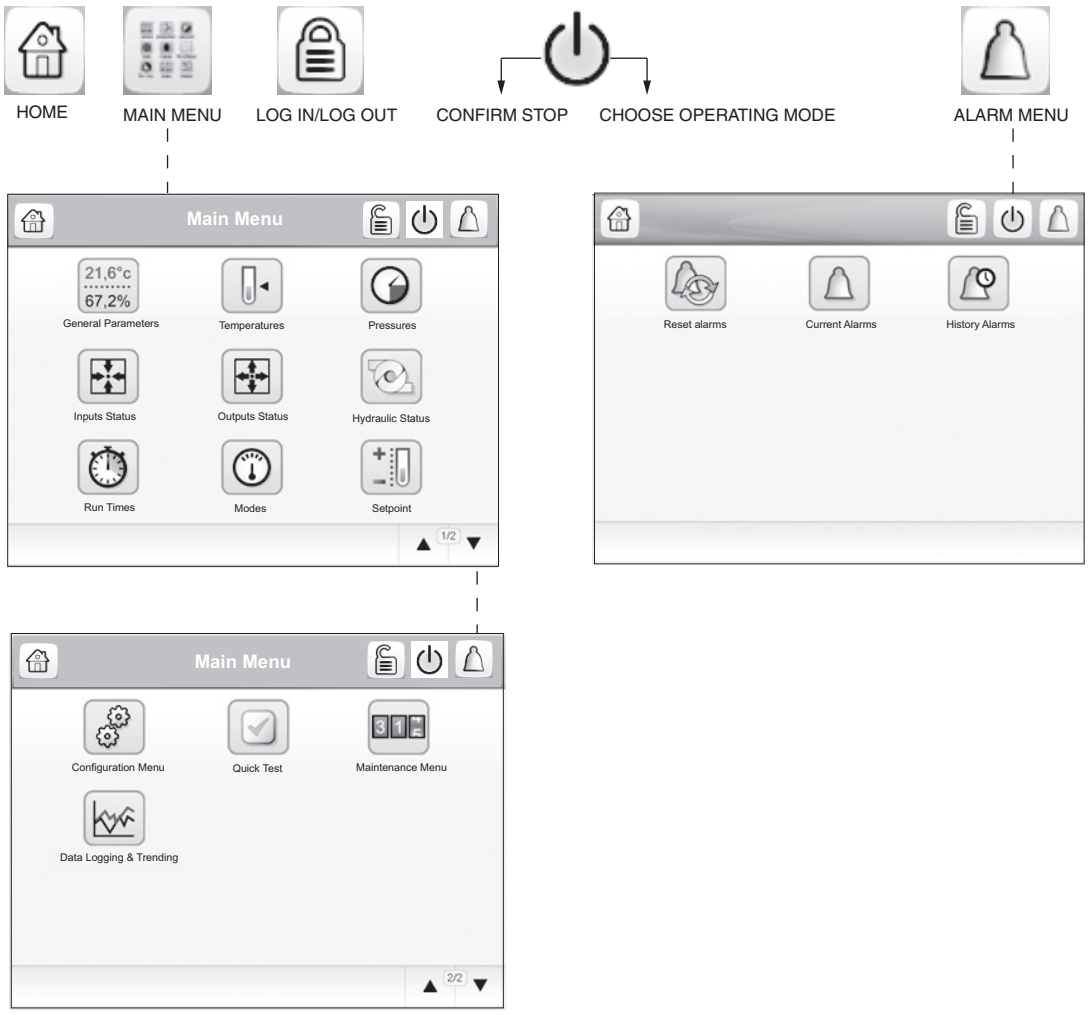


Fig. C — Screen Structure, Service/Factory Level Access (Service Password Required)

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Main Menu Description

ICON	DISPLAYED TEXT*	ACCESS	ASSOCIATED TABLE	PAGE NO.
	General Parameters	All	GENUNIT	61
	Temperatures	All	TEMP	62
	Pressures	All	PRESSURE	62
	Inputs Status	All	INPUTS	63
	Outputs Status	All	OUTPUTS	64
	Hydraulic Status	All	HYDRLIC	64
	Run Times	All	RUNTIME	65
	Modes	All	MODES	65
	Setpoint	User	SETPOINT	66
	Configuration Menu	User	CONFIG	67
	Quick Test	Service	QCK_TEST	66
	Maintenance Menu	Service	MAINTAIN	80
	Trendings	All	TRENDING	30

* Displayed text depends on the selected language (default is English).

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

GENERAL PARAMETERS

CCN TABLE NAME: GENUNIT

PIC 5 PATH: Main Menu → General Parameters

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Control Mode	ctl_mode	0 to 3			RO
2	0 = Local, 1 = Network					
3	2 = Remote, 3 = Local Sched					
4	Compressor1 Run Status	cm_stas1	0-14†			RO
5	Deter Start Stop Command	stat/stop				RO
6	Network: Cmd Start/Stop	CHIL_S_S	0 to 1			RW**
7	Network:Cmd Occupied	CHIL_OCC	0 to 1			RW**
8	Cooling / Heating Select	HC_SEL	COOL/HEAT	COOL		RW
9	Control Point	CTRL_PNT	10.0 to 160.0		°F	RW**
10	Control Point Reset	reset	–30.00 to 30.00		°F	RO
11	Actual Setpoint	setpoint	10.0 to 150.0		°F	RO
12	Percent Load Current	amps_p	0.0 to 999.0		%	RO
13	Active Demand Limit	DEM_LIM	10.0 to 100.0	100	%	RW**
14	Emergency Stop	EMSTOP	0 to 1	0		RW**
15	Chiller State Number	ch_state	0 to 500			RO
16	Chiller Run Status	ch_stat	0 to 2			RO
17	0 = OFF, 1 = READY, 2 = ON					
18	Local Schedule Occupied	loc_occ	NO/YES			RO
19	Ice Schedule Occupied	ice_occ	NO/YES			RO
20	MS Start Stop Command	ms_stsp	STOP/START			RO
21	Remote Reset Alarm	REM_RST	YES/NO			RO
22	Stop Override	STP_OVER	YES/NO	NO		RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

†0 = OFF
1 = CTLTEST
2 = PUMPDOWN
3 = LOCKOUT
4 = RECYCLE
5 = TRIPOUT
6 = TIMEOUT
7 = PRESTART
8 = STARTUP
9 = AUTORST
10 = RAMPING
11 = RUNNING
12 = OVERRIDE
13 = DEMAND
14 = SHUTDOWN

**RW from network.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Temperatures

CCN TABLE NAME: TEMP

PIC 5 PATH: Main Menu → Temperatures

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Entering Chilled Water	ECW	–40.0 to 245		°F	RO
2	Leaving Chilled Water	LCW	–40.0 to 245		°F	RO
3	Entering Condenser Water	ECDW	–40.0 to 245		°F	RO
4	Leaving Condenser Water	LCDW	–40.0 to 245		°F	RO
5	Evap Sat Refrig Temp	EVAP_SAT	–40.0 to 245		°F	RO
6	Evap Refrig Liquid Temp	EVAP_T	–40.0 to 245		°F	RO
7	Evaporator Approach	evap_app	0.0 to 99.0		°F	RO
8	Condenser Approach	cond_app	0.0 to 99.0		°F	RO
9	Cond Sat Refrig Temp	COND_SAT	–40.0 to 245		°F	RO
10	Comp Discharge Temp	DGT	–40.0 to 245		°F	RO
11	Discharge Superheat	DSH	–20.0 to 99.0		°F	RO
12	Comp Thrust Lvg Oil Temp	MTRB_OIL	–40.0 to 245		°F	RO
13	Comp Thrust Bearing Temp	MTRB	–40.0 to 245		°F	RO
14	LS Motor Bearing Temp	MTRB1	–40.0 to 245		°F	RO
15	LS Comp Bearing Temp	MTRB2	–40.0 to 245		°F	RO
16	HS Motor Bearing Temp	MTRB3	–40.0 to 245		°F	RO
17	HS Comp Bearing Temp	MTRB4	–40.0 to 245		°F	RO
18	Comp Motor Winding 1 Temp	MTRW1	–40.0 to 245		°F	RO
19	Comp Motor Winding 2 Temp	MTRW2	–40.0 to 245		°F	RO
20	Comp Motor Winding 3 Temp	MTRW3	–40.0 to 245		°F	RO
21	Oil Sump Temp	OILT_SMP	–40.0 to 245		°F	RO
22	Oil Supply Temp	OILT_DIS	–40.0 to 245		°F	RO
23	Calc Actual Lift	LIFT_A	0.0 to 200.0		°F	RO
24	VDO High Lift Load Line	LIFT_1	0.0 to 200.0		°F	RO
25	VDO Low Lift Load Line	LIFT_2	0.0 to 200.0		°F	RO
26	Remote Reset Sensor	R_RESET	–40.0 to 245		°F	RO

Pressures (Associated Table: PRESSURE)

CCN TABLE NAME: PRESSURE

PIC 5 PATH: Main Menu → Pressures

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Evaporator Pressure	EVAP_P	–6.7 to 420.0		psig	RO
2	Condenser Pressure	COND_P	–6.7 to 420.0		psig	RO
3	Economizer Pressure	ECON_P	–6.7 to 420.0		psig	RO
4	Oil Supply Pressure	OILP_DIS	–6.7 to 420.0		psig	RO
5	Oil Sump Pressure	OILP_SMP	–6.7 to 420.0		psig	RO
6	Oil Pump Delta P	OIL_PD	–6.7 to 420.0		psig	RO
7	Diffuser Pressure	DIFF_P	–6.7 to 420.0		psig	RO
8	Head Pressure Reference	HEAD_P	–6.7 to 420.0		psig	RO
9	Evap Entering Water Pres	EVAP_EWP	–6.7 to 420.0		psig	RO
10	Evap Leaving Water Pres	EVAP_LWP	–6.7 to 420.0		psig	RO
11	Cond Entering Water Pres	COND_EWP	–6.7 to 420.0		psig	RO
12	Cond Leaving Water Pres	COND_LWP	–6.7 to 420.0		psig	RO

LEGEND

*Default value is shown only if configurable in this table.

RO — Read Only
RW — Read/Write

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Input Status

CCN TABLE NAME: INPUTS

PIC 5 PATH: Main Menu → Input Status

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Compressor Start Contact	STAR_AUX	OPEN/CLOSE			RO
2	Compressor Run Contact	RUN_AUX	OPEN/CLOSE			RO
3	Damper Valve Fully Closed	DMP_FC	NO/YES			RO
4	Damper Valve Fully Opened	DMP_FO	NO/YES			RO
5	Damper Valve Status	DMP_ACT	0 to 3			RO
6	0=Closed, 1=Interim, 2=Opened 3=Failure					
7	HGBP Valve Fully Closed	HGBP_FC	NO/YES			RO
8	HGBO Valve Fully Opened	HGBP_FO	NO/YES			RO
9	HGBP Valve Status	HGBP_ACT	0 to 3			RO
10	0=Closed, 1=Interim, 2=Opened 3=Failure					
11	High Pressure Switch	HP_SW	OPEN/CLOSE			RO
12	Remote Contact	REM_CON	OPEN/CLOSE			RO
13	Emergency Stop Contact	E_STOP	OPEN/CLOSE			RO
14	Ice Build Contact	ICE_CON	OPEN/CLOSE			RO
15	Chiller Lockout	REM_LOCK	OPEN/CLOSE			RO
16	Spare Safety Input	SAFETY	OPEN/CLOSE			RO
17	Starter Fault Feedback	STARTFLT	OPEN/CLOSE			RO
18	Fire Security Interlock	FS_LOCK	OPEN/CLOSE			RO
19	Guide Vane 1 Actual Ohms	GV1_OHMS			ohms	RO
20	Guide Vane 1 Actual Pos	GV1_ACT			%	RO
21	VFD Actual Speed	VFD_ACT			%	RO
22	Diffuser Actual Pos	DIFF_ACT			%	RO
23	Auto Demand Limit Input	AUTO_DEM			mA	RO
24	Auto Water Temp Reset	AUTO_RES			mA	RO
25	Refrig Leak Sensor	REF_LEAK			mA	RO
26	Evap Flow Input	EVAPFLIN			mA	RO
27	Cond Flow Input	CONDFLIN			mA	RO
28	VFD Speed Feedback	VFD_IN			V	RO
29	Guide Vane 1 Act Input	GV1_MA			mA	RO
30	VFD Current Act Input	VFDC_MA			mA	RO
31	ISM Trip Relay Status	TRIPR	OPEN/CLOSE			RO
32	BACnet Dongle	bacdongl	NO/YES			RO

LEGEND

*Default value is shown only if configurable in this table.

RO — Read Only
RW — Read/Write

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Output Status

CCN TABLE NAME: OUTPUTS

PIC 5 PATH: Main Menu → Output Status

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Diffuser Output	DIFF_OUT	4.0 to 20.0		mA	RO
2	Head Pres Output	HDPV_OUT	4.0 to 20.0		mA	RO
3	Chiller Status Output	CHST_OUT	4.0 to 20.0		mA	RO
4	VFD Speed Output	VFD_OUT	4.0 to 20.0		mA	RO
5	Head Pres Valve Tgt Pos	hdpv_tgt	0.0 to 100.0		%	RO
6	Guide Vane 1 Output	GV1_OUT	0.0 to 20.8		mA	RO
7	Alarm Relay	ALM	OFF/ON		OFF/ON	RO
8	Alert Relay	ALE	OFF/ON		OFF/ON	RO
9	Compressor Start Relay	COMP_SR	OFF/ON		OFF/ON	RO
10	Starter Trans Sw Status	TRANS	OFF/ON		OFF/ON	RO
11	Damper Valve Close	DMP_CL	OFF/ON		OFF/ON	RO
12	Damper Valve Open	DMP_OP	OFF/ON		OFF/ON	RO
13	Guide Vane 1 Decrease	GV1_DEC	OFF/ON		OFF/ON	RO
14	Guide Vane 1 Increase	GV1_INC	OFF/ON		OFF/ON	RO
15	Hot Gas Bypass Close	HGBP_OFF	OFF/ON		OFF/ON	RO
16	Hot Gas Bypass Open	HGBP_ON	OFF/ON		OFF/ON	RO
17	Oil Heater Relay	OIL_HEAT	OFF/ON		OFF/ON	RO
18	Oil Pump Relay	OIL_PUMP	OFF/ON		OFF/ON	RO
19	Tower Fan Relay High	TFR_HIGH	OFF/ON		OFF/ON	RO
20	Tower Fan Relay Low	TFR_LOW	OFF/ON		OFF/ON	RO
21	Damper Valve Tgt Pos	dmp_tgt	0 to 2			RO
22	0=Close,1=Hold, 2=Open					RO
23	HGBP Valve Tgt Pos	hgbp_tgt	0 to 2			RO
24	0=Close,1=Hold, 2=Open					RO

Hydraulic Status

CCN TABLE NAME: HYDRLIC

PIC 5 PATH: Main Menu → Hydraulic Status

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Condenser Water Flow	CDW_FLOW	NO/YES		—	RO
2	Chilled Water Pump	CHWP	OFF/ON		—	RO
3	Cond Entering Water Pres	COND_EWP	–6.7 to 420.0		psig	RO
4	Cond Leaving Water Pres	COND_LWP	–6.7 to 420.0		psig	RO
5	Condenser Water Delta P	cdw_pd	–6.7 to 420.0		psig	RO
6	Cond Water Pulldown/Min	cdw_pull	–20 to 20.0		°F	RO
7	Condenser Water Pump	CDWP	OFF/ON		—	RO
8	Chilled Water Flow	CHW_FLOW	NO/YES		—	RO
9	Evap Enter Water Pres	EVAP_EWP	–6.7 to 420.0		psig	RO
10	Evap Leaving Water Pres	EVAP_LWP	–6.7 to 420.0		psig	RO
11	Chilled Water Delta P	chw_pd	–6.7 to 420.0		psig	RO
12	Chilled Water Pulldown/Min	chw_pull	–20 to 20.0		°F	RO
13	Tower Fan Relay High	TFR_HI	OFF/ON		—	RO
14	Tower Fan Relay Low	TFR_LO	OFF/ON		—	RO
15	Controlled Water DT	ctrlw_dt	–40.0 to 245.0		°F	RO
16	Cond Water Flow Status	cdw_fl_s	0 to 2			RO
17	0=Fail or Not Started					
18	1=Success, 2=Verifying					
19	Evap Water Flow Status	chw_fl_s	0 to 2			RO
20	0=Fail or Not Started					
21	1=Success, 2=Verifying					
22	Pumpdown/Lockout State	pdown_st	0 to 255			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Run Times

CCN TABLE NAME: RUNTIME

PIC 5 PATH: Main Menu → Run Times

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Starts in 12 Hours	ST_CNT12	0 to 8			RO
2	Total Compressor Starts	C_STARTS	0 to 99999			RO
3	Compressor Ontime	COMP_HRS	0 to 500000.0		hr	RO
4	Service Ontime	SRV_HRS	0 to 500000.0	0.0	hr	RW
5	Stop to Start Timer	spst_tim	1.0 to 15.0		min	RO
6	Start to Start Timer	stst_tim	4.0 to 45.0		min	RO
7	Recy Startup in 4 Hours	RCYSTCNT	0 to 6			RO

NOTE: The displayed runtime is updated every hour. To avoid the loss of data in case of disruption, the values are backed up.

Modes

CCN TABLE NAME: MODES

PIC 5 PATH: Main Menu → Modes

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Normal Shutdown Active	shut_nor	NO/YES			RO
2	Recy Shutdown Active	shut_rcy	NO/YES			RO
3	Alarm Shutdown Active	shut_alm	NO/YES			RO
4	Recy Startup Active	str_rcy	NO/YES			RO
5	Temp Ramping Active	tmp_ramp	NO/YES			RO
6	Load Ramping Active	ld_ramp	NO/YES			RO
7	GV1 Inhibit Active	gv1_inh	NO/YES			RO
8	Ice Build Active	ice_act	NO/YES			RO
9	Ice Build Terminated	ice_term	NO/YES			RO
10	Ice Build Recy Startup	ice_rcy	NO/YES			RO
11	Ramp Loading Active	ramp_act	NO/YES			RO
12	Demand Limit Active	dem_act	NO/YES			RO
13	VFD Rampdown Active	vfdrpact	NO/YES			RO
14	Demand Limit Inh Active	dem_inh	NO/YES			RO
15	Evap Freeze Active	evapfrze	NO/YES			RO
16	Cond Freeze Active	condfrze	NO/YES			RO
17	Recy Shutdown Complete	rcysh_cm	NO/YES			RO
18	NonRecycle Shutdown Done	nrysh_cm	NO/YES			RO
19	Alarm Active	alm_act	NO/YES			RO
20	Auto Restart Active	aurs_act	NO/YES			RO
21	Override Active	over_act	NO/YES			RO
22	Swift Restart Active	sfrs_act	NO/YES			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Setpoint Table

CCN TABLE NAME: SETPOINT

PIC 5 PATH: Main Menu → Setpoint

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Heating ECDW Setpoint	ecdw_sp	63.0 to 150.0	104.0	°F	RW
2	Cooling ECW Setpoint	ecw_sp	15.0 to 120.0	60.0	°F	RW
3	Ice Build Setpoint	ice_sp	15.0 to 60.0	40.0	°F	RW
4	Heating LCDW Setpoint	lcdw_sp	68.0 to 150.0	113.0	°F	RW
5	Cooling LCW Setpoint	lcw_sp	10.0 to 120.0	45.0	°F	RW
6	Base Limit Demand	dem_base	10.0 to 100.0	100.0	%	RW
7	EWT Control Option	EWT_OPT	DSABLE/ENABLE	DSABLE	—	RW

Quick Test

CCN TABLE NAME: QCK_TEST

PIC 5 PATH: Main Menu → Quick Test

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Quick Test Enable	QCK_TEST	DSABLE/ENABLE	DSABLE		RW
2	GV 1 Calibration Enable	GV1_CAL	DSABLE/ENABLE	DSABLE		RW
3	GV1 Calibration Status	GV1_STAT	0 to 2			RO
4	0=No Calibration or Failure					
5	1=In Progress, 2=Completed					
6	Guide Vane 1 Actual Ohms	GV1_OHM	0.00 to 12000.00			RO
7	Guide Vane 1 Ohms 100%	GV1_MAXO	0.00 to 12000.00			RO
8	Guide Vane 1 Ohms 0%	GV1_MINO	0.00 to 12000.00			RO
9	Guide Vane 1 Actual mA	GV1_MAF	0.0 to 20.8		mA	RO
10	Guide Vane 1 mA 100%	GV1_MAXA	0.0 to 20.8		mA	RO
11	Guide Vane 1 mA 0%	GV1_MINA	0.0 to 20.8		mA	RO
12	Guide Vane 1 Forced Position	Q_GV1POS	0.0 to 100.0	0.0	%	RW
13	Oil Pump Delta Pressure	OIL_PDQ	–6.7 to 420.0		psig	RO
14	Quick Test Head Val Pos	Q_HDP	0.0 to 100.0	0.0	%	RW
15	Quick Test Diffuser Pos	Q_SRD	0.0 to 100.0	0.0	%	RW
16	Quick Test Chiller Status	Q_CHST	4.0 to 20.0	4.0	mA	RW
17	Quick Test Oil EXV	Q_EXV	4.0 to 20.0	4.0	mA	RW
18	Condenser Water Delta T	CDW_DT	–40.0 to 245.0		°F	RO
19	Chilled Water Delta T	CHW_DT	–40.0 to 245.0		°F	RO
20	Cond Water Deviation	CDWT_DV	OFF/ON			RO
21	Chilled Water Deviation	CHWT_DV	OFF/ON			RO
22	Quick Test Oil Pump	Q_OILP	OFF/ON	OFF		RW
23	Oil Pres Test Passed	OP_PASS	NO/YES			RO
24	Quick Test Oil Heater	Q_OILH	OFF/ON	OFF		RW
25	Quick Test GV1 Open	Q_GV1OP	OFF/ON	OFF		RW
26	Quick Test GV1 Close	Q_GV1CL	OFF/ON	OFF		RW
27	Quick Test HGBP Open	Q_HGBPOP	OFF/ON	OFF		RW
28	Quick Test HGBP Close	Q_HGBPCL	OFF/ON	OFF		RW
29	Quick Test Damper Open	Q_DMPOP	OFF/ON	OFF		RW
30	Quick Test Damper Close	Q_DMPCL	OFF/ON	OFF		RW
31	Quick Test Alarm Output	Q_ALM	OFF/ON	OFF		RW
32	Quick Test Alert Output	Q_ALE	OFF/ON	OFF		RW
33	Quick Test Cond Pump	Q_CDWP	OFF/ON	OFF		RW
34	Quick Test Chilled Pump	Q_CHWP	OFF/ON	OFF		RW

LEGEND

*Default value is shown only if configurable in this table.

RO — Read Only
RW — Read/Write

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Configuration Menu

Navigation: MAIN MENU → CONFIGURATION MENU

ICON	DISPLAYED TEXT	ACCESS	ASSOCIATED TABLE	PAGE NO.
	Service Parameters	Service	SERVICE1	68
	Surge Correction Config	Service	CFGSURGE	68
	Protective Limit Config	Service	CFGLIMIT	69
	Lab Test Forced	Service	LABONLY	Factory only
	Option Configuration	Service	CONF_OPT	69
	ISM Configuration	Service	CONF_ISM	70
	Factory Parameters	Factory	FACTORY	71
	General Configuration	User	GEN_CONF	71
	Control Identification	User	CTRL_ID	Info. only
	Hydraulic System Config	Service	HYDRCONF	Not used
	VFD Parameters	Service	CONF_VFD	72
	SRD Configuration	Service	CONF_SRD	72
	IOB Configuration	Service	CONF_IOB	73
	E-Mail Configuration	Service	EMAILCFG	73
	Master Slave Config	Service	CONF_MS	74
	Prognostics Config	Service	CONF_PRG	74
	Loadshed	Service	LOADSHED	Not used
	Reset Configuration	User	RESETCFG	75
	User Configuration	User	USERCONF	75
	Schedule Menu	User	SCHEDULE	76
	Holiday Menu	User	HOLIDAY	78
	Broadcast Menu	User	BROADCAST	Not used
	Date/Time Configuration	User	DATETIME	—
	Bacnet Config	Service	BACNET	79

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Service Parameters

CCN TABLE NAME: SERVICE1

PIC 5 PATH: Main Menu → Configuration Menu → Service Parameters

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Service Password	ser_pass	0 to 9999	2222		RW
2	Demand Watts Interval	dw_int	5 to 60	15	min	RW
3	Derivatived EWT Gain	ewtdgain	1.0 to 3.0	2.0		RW
4	Controlled Fluid DB	ctrl_db	0.5 to 2.0	1.0	°F	RW
5	Proportional Dec Band	gv1decdb	2.0 to 10.0	6.0		RW
6	Proportional Inc Band	gv1incdb	2.0 to 10.0	6.5		RW
7	Demand Limit Prop Band	dem_pdb	3.0 to 15.0	10.0	%	RW
8	Demand Limit At 20 mA	dem_20ma	10 to 100	40	%	RW
9	GV1 Travel Limit	gv1_lim	30 to 100	80	%	RW
10	Amps or KW Ramp per Min	ldramprt	5 to 20	10	%	RW
11	Temp Ramp Rate per Min	tmramprt	1 to 10	3	°F	RW
12	Damper Valve Act Delay	dmp_dly	0 to 20	5	min	RW
13	Recycle Shutdown Delta T	rcysh_dt	0.5 to 4.0	1.0	°F	RW
14	Recycle Restart Delta T	rcyst_dt	2.0 to 10.0	5.0	°F	RW
15	Damper Valve Close DB	dmp_cldb	2.0 to 10.0	5.0	psig	RW
16	Damper Valve Open DB	dmp_opdb	10.0 to 20.0	13.0	psig	RW
17	Oil Press Verify Time	oilpvr_t	15 to 300	40	sec	RW
18	Soft Stop Amps Threshold	sf_st_th	40 to 100	70	%	RW
19	Water Flow Verify Time	wflow_t	0.5 to 5.0	5.0	min	RW
20	MBB Power Calibration	mbb_pfcl	0.900 to 1.000	0.970		RW
21	Maximum GV Movement	max_gv	2.0 to 4.0	2.0	%	RW
22	Enable Excessive Starts	ex_start	YES/NO	NO		RW

Surge Correction Config

CCN TABLE NAME: CFGSURGE

PIC 5 PATH: Main Menu → Configuration Menu → Surge Correction Config

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Surge Delta Tsmax	dts_max	0.0 to 150.0	70.0	° F	RW
2	Surge Delta Tsmin	dts_min	0.0 to 150.0	45.0	° F	RW
3	IGV1 Full Load Open Deg	gv1_dful	90 to 120.0	88.0	degree	RW
4	Sound Control IGV1 Open Deg	gv1_dmed	10.0 to 40.0	27.0	degree	RW
5	IGV1 Minimum Open Deg	gv1_dmin	0.0 to 10.0	2.0	degree	RW
6	IGV1 Maximum Open Deg	gv1_dmax	90.0 to120.0	109.0	degree	RW
7	Envelope Line Offset	sgl_off	1.0 to 3.0	2.0	° F	RW
8	Envelope Deadband	sghg_db	0.5 to 3.0	1.5	° F	RW
9	Envelope High Offset	sgl_hoff	0.1 to 3.0	1.5	° F	RW
10	Surge Line Shape Factor	sgl_shfh	–1.000 to 0.000	–0.010		RW
11	Sound Line Shape Factor	sgl_shfl	0.000 to 1.000	0.010		RW
12	Envelope Speed Factor	sgl_spdf	0.00 to 3.00	2.00		RW
13	Surge Delay Time	surg_del	0 to 120	15	sec	RW
14	Surge Delta Amps %	surge_a	5 to 40	20	%	RW
15	Surge Time Period	surge_t	7 to 10	8	min	RW
16	GV1 Close Surge Prote	gvstp_sg	2.0 to 4.0	3.0	%	RW
17	VFD Speed Step Surge	vfdstpsg	1.0 to 5.0	1.5	%	RW
18	PR at Full Load Opening	pr_ful	1.0000 to 5.0000	3.0000		RW
19	PR at Min. Opening	pr_min	1.0000 to 5.0000	1.5000		RW
20	Atmospheric Pressure	atom_pre	8.000 to 15.000	14.5000	psi	RW
21	High Efficiency Mode	high_eff	DSABLE/ENABLE	DSABLE		RW
22	High Noise Alert	noi_alt	DSABLE/ENABLE	DSABLE		RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Protective Limit Config

CCN TABLE NAME: CFGLIMIT

PIC 5 PATH: Main Menu → Configuration Menu → Protective Limit Config

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Condenser Freeze Point	cdfreeze	–20 to 35	34	°F	RW
2	Evap Approach Alert	evap_al	0.5 to 15	5	°F	RW
3	Cond Approach Alert	cond_al	0.5 to 15	6	°F	RW
4	Evap Flow Delta P Cutout	evap_cut	0.5 to 50	5	psig	RW
5	Cond Flow Delta P Cutout	cond_cut	0.5 to 50	5	psig	RW
6	Cond Hi Flow DP Limit	cond_val	0.5 to 50	50	psig	RW
7	Cond Press Override Low	cpov_lo	90 to 150	140	psig	RW
8	Cond Press Override High	cpov_hi	200 to 260	250	psig	RW
9	Comp Discharge Alert	dgt_alrt	125 to 200	200	°F	RW
10	Evap Override Delta T	ert_ovdt	2 to 5	3	°F	RW
11	Evap Refrig Trippoint	ert_trip	0 to 40	33	°F	RW
12	Comp Motor Temp Override	mt_over	150 to 200	200	°F	RW
13	Comp Bearing Temp Alert	tb_alert	155 to 175	175	°F	RW
14	Comp Bearing Temp Trip	tb_trip	175 to 185	185	°F	RW
15	Cond Press Cutout Low	cpcut_lo	155 to 160	160	psig	RW
16	Cond Press Cutout High	cpcut_hi	270 to 275	275	psig	RW
17	Minimum Brine LWT	bri_min	10 to 34	34	°F	RW
18	LS Comp Bearing Alert	tb_alt2	155 to 190	185	°F	RW
19	LS Comp Bearing Trip	tb_trip2	185 to 210	200	°F	RW
20	LWT Protection Setpoint	lwtp_sp	41 to 50	42.8	°F	RW
21	Cond Hi Flow Alarm	cond_alm	DSABLE/ENABLE	DSABLE		RW

Option Configuration

CCN TABLE NAME: CONF_OPT

PIC 5 PATH: Main Menu → Configuration Menu → Option Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Auto Restart Option	astart	DSABLE/ENABLE	DSABLE		RW
2	Common Sensor Option	commsens	DSABLE/ENABLE	DSABLE		RW
3	Water Pressure Option	wp_opt	DSABLE/ENABLE	DSABLE		RW
4	HGBP Valve Is Configured	hgbp_opt	DSABLE/ENABLE	DSABLE		RW
5	HGBP Selection 0 = Disable, 1= Surge 2 = Low Load, 3 = Comb	hgbp_sel	0 to 3	0		RW
6	GV1 Closure at Startup	gv1stpos	0.0 to 40.0	4.0	%	RW
7	HGBP Open IGV1 Position	hpop_gv1	0.5 to 10	5.0	%	RW
8	HGBP Close IGV1 Position	hgcl_gv1	1.5 to 20	10.0	%	RW
9	HGBP Off DT for Low Load	hgb_toff	0.5 to 10.0	4.0	^ F	RW
10	HGBP On DT for Low Load	hgb_ton	0.5 to 10.0	2.0	^ F	RW
11	HGBP Low Load DB	hgbp_ldb	0.5 to 2.0	1.0	^ F	RW
12	Head Pres Delta P 0%	hdp_0	20.0 to 85.0	25.0	psig	RW
13	Head Pres Delta P 100%	hdp_100	20.0 to 85.0	50.0	psig	RW
14	Head Pressure Min Output	hdpv_min	0.0 to 100.0	0.0	%	RW
15	Oil Temp High Threshold	oil_high	100 to 140	120	° F	RW
16	Oil Temp Low Threshold	oil_low	90 to 130	110	° F	RW
17	Gas Torque Factor	gt_fact	0.25 to 3.0	1	° F	RW
18	Guide Vane/SRD Factor	gv_srd_f	0.7 to 1.20	0.95		RW
19	Power Recovery Timeout	pd_tcfg	0 to 60	15	min	RW
20	Ice Build Option	ice_opt	DSABLE/ENABLE	DSABLE		RW
21	Ice Build Recycle	ice_recy	DSABLE/ENABLE	DSABLE		RW
22	Ice Build Termin Source 0 = Temp, 1 = Contact, 2 = Both	ice_term	0 to 2	0		RW
23	Refrig Leak Alarm mA	leak_ma	4 to 20	20	mA	RW
24	Tower Fan High Setpoint	tfh_sp	55 to 105	75		RW
25	Refrigerant Leak Option	leak_en	DSABLE/ENABLE	DSABLE		RW
26	Head Pres Valve Option	hdpv_opt	DSABLE/ENABLE	DSABLE		RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

ISM Configuration

CCN TABLE NAME: CONF_ISM

PIC 5 PATH: Main Menu → Configuration Menu → ISM Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Communication Timeout	com_tout	0 to 255	10	sec	RW
2	Starter Type	star_typ	0 to 3	0		RW
3	0 = Full Volt, 1 = Reduced Volt					
4	2 = Solid State, 3 = FS VFD					
5	Single Cycle Dropout	scycd_en	DSABLE/ENABLE	DSABLE		RW
6	Motor Rated Load Amps	rla	10 to 5000	200	amp	RW
7	Motor Locked Rotor Trip	mot_lra	100 to 65535	1000	amp	RW
8	Locked Rotor Start Delay	lrs_del	1 to 10	5	cycles	RW
9	Starter LRA Rating	str_lra	100 to 65535	2000	amp	RW
10	Motor Rated Line Voltage	rlv	200 to 13800	460	V	RW
11	Current Umbal Threshold	cu_th	5 to 100	15	%	RW
12	Voltage Umbal Threshold	vu_th	1 to 10	5	%	RW
13	Motor Current CT Ratio:1	ct_ratio	3 to 1000	100		RW
14	Volt Transformer Ratio:1	vt_rat	1 to 115	1		RW
15	Current Umbal Persist	cu_per	1 to 10	5	sec	RW
16	Voltage Umbal Persist	vu_per	1 to 10	5	sec	RW
17	Line Frequency Faulting	lfref_en	DSABLE/ENABLE	DSABLE		RW
18	Frequency=60 Hz? (No = 50 Hz)	linefreq	DSABLE/ENABLE	DSABLE		RW
19	Ground Fault Protection	gfp_en	DSABLE/ENABLE	ENABLE		RW
20	Ground Fault Current	gf_amps	1 to 25	15	amp	RW
21	Ground Fault Persistence	gfp_pers	1 to 10	5	cycles	RW
22	Ground Fault Start Delay	gfs_del	1 to 20	10	cycles	RW
23	Ground Fault CT Ratio:1	gfct_rat	150 to 150	150	—	RW
24	Overvoltage Threshold	ovvol_th	105 to 115	115	%	RW
25	Undervoltage Threshold	udvol_th	85 to 95	85	%	RW
26	Over Under Volt Persist	ovud_per	1 to 10	5	sec	RW
27	Under Volt Start Delay	uvs_del	1 to 4	1	sec	RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Factory Parameters

CCN TABLE NAME: FACTORY

PIC 5 PATH: Main Menu → Configuration Menu → Factory Parameters

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Chiller Type 0 = NGC, 1 = Legacy	chil_typ	0 to 1	0		RW
2	Unit Type 0 = Cool Only, 1 = Heat Machine	unit_typ	0 to 1	0		RW
3	Refrigerant Type 0 = R134a, 1 = Low Pressure	refg_typ	0 to 1	0		RW
4	Country Code	coun_cod	0 to 500	86		RW
5	Comp 0 = Single, 1 = Dual	comp_typ	0 to 1	1		RW
6	Condenser Type 0 = Low Pres, 1 = High Pres	cond_typ	0 to 1	0		RW
7	Chilled Medium	chmedium	WATER/BRINE	WATER		RW
8	Factory Password	fac_pass	0 to 65535	4444		RW
9	Power Freq 60Hz Select	freq_60h	YES/NO	NO		RW
10	Free Coolling Option	freecool	YES/NO	NO		RW
11	VFD Option 0 = No, 1 = FS FVD, 2 = UM VFD	vfd_opt	0 to 2	0		RW
12	Hydraulic System Option	hyd_opt	YES/NO	NO		RW
13	Starter Type 0 = Full, 1 = Reduced Voltage 2 = Solid State, 3 = VFD	startype	0 to 3	0		RW
14	Motor Rated Kilowatts	rkw	50 to 9999	145	kW	RW
15	Low Entered Volt V1 IOB	lv_enth	17 to 19	17	V	RW
16	Low Exited Volt V2 IOB	lv_exth	19 to 21	19	V	RW
17	Heat Reclaim Option	heatrecl	YES/NO	NO		RW
18	Guide Vane1 Type 0 = Digital, 1 = Analog	gv1_type	0 to 1	0		RW
19	VFD Feedback Voltage Sel 0 = 0 to 5 V, 1 = 0 to 10 V	vfd_fdv	0 to 1	0		RW

General Configuration

CCN TABLE NAME: GEN_CONF

PIC 5 PATH: Main Menu → Configuration Menu → General Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Stop to Start Delay	min_off	1 to 15	2	min	RW
2	Start to Start Delay	strt_dly	4 to 45	15	min	RW
3	Demand Limit Type	dem_sel	0 to 1	0		RW
4	0 = Base Demand, 1 = 4 to 20 mA					
5	Pulldown Ramp Type	ramp_slct	0 to 1	1		RW
6	0 = Temp, 1= Load					
7	Demand Limit Source	DEM_SLCT	0 to 1	0		RW
8	0 = amps, 1 = kW					

LEGEND

*Default value is shown only if configurable in this table.

RO — Read Only
RW — Read/Write

VFD Parameters

CCN TABLE NAME: CONF_VFD

PIC 5 PATH: Main Menu → Configuration Menu → VFD Parameters

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	VFD Gain	vfd_gain	0.10 to 1.50	0.75	—	RW
2	VFD Maximum Speed	vfd_max	90.0 to 110.0	100.0	%	RW
3	VFD Minimum Speed	vfd_min	65.0 to 100.0	70.0	%	RW
4	VFD Start Speed	vfd_str	65.0 to 100.0	80.0	%	RW
5	VFD Surge Line Gain	vfd_slg	2.0 to 3.5	2.0	—	RW
6	VFD Current Limit	vfdculm	0.0 to 99999.0	250	amp	RW
7	VFD Load Current 20 mA	vfdc20ma	10.0 to 5000.0	200.0	amp	RW
8	Comp Frequency 100%	comp_100	45.0 to 62.0	50.0	Hz	RW

SRD Configuration

CCN TABLE NAME: CONF_SRD

PIC 5 PATH: Main Menu → Configuration Menu → SRD Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Diffuser Option	diff_opt	DSABLE/ENABLE	DSABLE		RW
2	SRD IGV Offset Select	off_sel	1 to 5	3		RW
3	Low Lift Profile Select	pro_sel	1 to 5	3		RW
4	Diffuser Full Span mA	diff_ma	15.0 to 22.0	18.0	mA	RW
5	GV1 Pos @ 25% Load	gv11_25	0.0 to 83.0	6.4	%	RW
6	GV1 Pos @ 50% Load	gv11_50	0.0 to 83.0	22.9	%	RW
7	GV1 Pos @ 75% Load	gv11_75	0.0 to 83.0	41.3	%	RW
8	SRD Pos @ 25% Load	srd1_25	0.0 to 100.0	73.5	%	RW
9	SRD Pos @ 50% Load	srd1_50	0.0 to 100.0	35.1	%	RW
10	SRD Pos @ 75% Load	srd1_75	0.0 to 100.0	19.5	%	RW
11	High Lift Load @ 100%	lf1_100	0.0 to 100.0	67.5	°F	RW
12	High Lift Load @ 25%	lf1_25	0.0 to 100.0	52.4	°F	RW
13	Low Lift Load @ 25%	lf2_25	0.0 to 100.0	27.2	°F	RW
14	Peak Detection Threshold	peak_th	0.0000 to 5.0000	0.0000	Volts	RW
15	Peak Detection Channel	peak_ch3	0 to 10	0		RW

LEGEND

*Default value is shown only if configurable in this table.

RO — Read Only
RW — Read/Write

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

IOB Configuration

CCN TABLE NAME: CONF_IOB

PIC 5 PATH: Main Menu → Configuration Menu → IOB Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	ECW IOB1 AI#1 Type		0 to 6	4		RW
2	LCW IOB1 AI#2 Type		0 to 6	4		RW
3	ECDW IOB1 AI#3 Type		0 to 6	4		RW
4	LCDW IOB1 AI#4 Type		0 to 6	4		RW
5	VFDC IOB1 AI#10 Type		0 to 5	2		RW
6	CHSTOUT IOB1 AO#1 Type		0 to 2	1		RW
7	MTRW1 IOB2 AI#1 Type		0 to 6	4		RW
8	MTRW2 IOB2 AI#2 Type		0 to 6	4		RW
9	MTRW3 IOB2 AI#3 Type		0 to 6	4		RW
10	OIL_DIS IOB2 AI#4 Type		0 to 6	0		RW
11	AUTO_DEM IOB2 AI#8 Type		0 to 5	0		RW
12	REF_LEAK IOB2 AI#9 Type		0 to 5	0		RW
13	IGV1_OUT IOB2 AO#1 Type		0 to 2	1		RW
14	OILEXVO IOB2 AO#2 Type		0 to 2	1		RW
15	MTRB1 IOB3 AI#1 Type		0 to 6	4		RW
16	MTRB2 IOB3 AI#2 Type		0 to 6	4		RW
17	MTRB3 IOB3 AI#3 Type		0 to 6	4		RW
18	MTRB4 IOB3 AI#4 Type		0 to 6	4		RW
19	R_RESET IOB3 AI#5 Type		0 to 5	0		RW
20	GV1_POS IOB3 AI#6 Type		0 to 5	5		RW
21	AUTO_RES IOB3 AI#8 Type		0 to 5	0		RW
22	DIFF_ACT IOB3 AI#9 Type		0 to 5	0		RW
23	HUMID IOB3 AI#10 Type		0 to 5	0		RW
24	HDPV_OUT IOB3 AO#1 Type		0 to 2	1		RW
25	DIFF_OUT IOB3 AO#2 Type		0 to 2	1		RW
26	EVAP_FL IOB4 AI#1 Type		0 to 6	0		RW
8	COND_FL IOB4 AI#2 Type		0 to 6	0		RW

E-Mail Configuration

CCN TABLE NAME: EMAILCFG

PIC 5 PATH: Main Menu → Configuration Menu → E-Mail Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	E-Mail Function		DSABLE/ENABLE	DSABLE		RW
2	Sender Email Part 1		24 characters			RW
3	Sender Email Part 2		24 characters			RW
4	Recip 1 Email Part 1		24 characters			RW
5	Recip 1 Email Part 2		24 characters			RW
6	Recip 2 Email Part 1		24 characters			RW
7	Recip 2 Email Part 2		24 characters			RW
8	SMTP IP Addr Part 1		0 to 255	0		RW
9	SMTP IP Addr Part 2		0 to 255	0		RW
10	SMTP IP Addr Part 3		0 to 255	0		RW
11	SMTP IP Addr Part 4		0 to 255	0		RW
12	Account Email Part 1		24 characters			RW
13	Account Email Part 2		24 characters			RW
14	Account Password		24 characters			RW
15	Port Number		0 to 255	25		RW
16	Server Timeout		0 to 255	30	sec	RW
17	Server Authentication 0 = No Authentication, 1 = Username Only 2 = Username & domain name		0 to 2	0		RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Master Slave Configuration

CCN TABLE NAME: CONF_MS

PIC 5 PATH: Main Menu → Configuration Menu → Master Slave Config

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Slave Address	slv_addr	1 to 236	2		RW
2	Master/Slave Select 0=Disable, 1=Master, 2=Slave	msl_sel	0 to 2	0		RW
3	Master Control Type 1=Local, 2=Network 3=Remote, 4=LS	ms_ctrl	1 to 4	1		RW
4	Chiller Connection Type 0=Parallel, 1=Series	ms_type	0 to 1	0		RW
5	Master Chiller Position 0=Upstream, 1=Downstream	ms_pos	0 to 1	0		RW
6	Master Lead/Lag Select 0=Lead,Lag Once Failed 1=Lead/Lag Runtime Sel	lead_sel	0 to 1	0		RW
7	Master per Capacity	ms_per	25 to 75	50	%	RW
8	LAG Shutdown Threshold	lag_shut	25 to 75	50	%	RW
9	Prestart Fault Time	pref_tim	2 to 30	5	min	RW
10	Unload Threshold	un_th	50 to 100	100	%	RW
11	Lead/Lag Balance Delta	ll_bal_d	40 to 400	168	hr	RW
12	Lag Start Timer	lstr_tim	2 to 30	10	min	RW
13	Lag Stop Timer	lstp_tim	2 to 30	10	min	RW
14	Lead Pulldown Time	lead_pul	0 to 60	0	min	RW
15	Lad Minimum Run Time	lag_mini	0 to 150	0	min	RW
16	Series Counter Flow	serct_fl	YES/NO	NO		RW

Prognostics Config

CCN TABLE NAME: CONF_PRG

PIC 5 PATH: Main Menu → Configuration Menu → Prognostics Config

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Prog Function Enable	prog_en	YES/NO	NO		RW
2	Oil Charge Completed	oilch_cm	YES/NO	YES		RW
3	Oil Filter Change Done	oilfc_cm	YES/NO	YES		RW
4	Refrigerant Charge Done	refch_cm	YES/NO	YES		RW
5	Oil Filter Pres Diff	oilfl_th	0 to 420	10	psig	RW
6	Oil Change Duration	oilch_nt	0 to 43800	8760	hr	RW
7	Trans Calib Threshold	refgc_th	0 to 5	2	psig	RW
8	Low Charge Cond Approach	rch_cath	20 to 40	20	°F	RW
9	Evap Design Approach	ep_dgap	0 to 10	3	°F	RW
10	Bearing Degradation	beart_th	100 to 230	200	°F	RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Reset Configuration

CCN TABLE NAME: RESETCFG

PIC 5 PATH: Main Menu → Configuration Menu → Reset Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Temp Reset Type	res_sel	0 to 3	0		RW
2	0 = No, 1 = 4 to 20 mA					
3	2 = Remote Temp, 3 = Water DT [delta temperature]					
4	Degrees Reset At 20 mA	der_20ma	–30.0 to 30.0	10.0	°F	RW
5	Maximum Deg Temp Reset	deg_rset	–30.0 to 30.0	10.0	°F	RW
6	Remote Temp Full Reset	remtm_fu	–40.0 to 245.0	65.0	°F	RW
7	Remote Temp No Reset	remtm_no	–40.0 to 245.0	85.0	°F	RW
8	Deg Reset Water DT Full	drwdt_fu	–30.0 to 30.0	10.0	°F	RW
9	Controlled DT Full Reset	ctldt_fu	0.0 to 15.0	0.0	°F	RW
10	Controlled DT No Reset	ctldt_no	0.0 to 15.0	0.0	°F	RW

User Configuration

CCN TABLE NAME: USERCONF

PIC 5 PATH: Main Menu → Configuration Menu → User Configuration

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	User Password	use_pass	1 to 9999	1111		RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Schedule Menu

Navigation: MAIN MENU → CONFIGURATION MENU → SCHEDULE MENU

ICON	DISPLAYED TEXT	ACCESS	ASSOCIATED TABLE	PAGE NO.
	Local Schedule	User	MENUOCC1	76
	Ice Build Schedule	User	MENUOCC2	76
	Network Schedule	User	MENUOCC3	77

Local Schedule

CCN TABLE NAME: MENUOCC1

PIC 5 PATH: Main Menu → Configuration Menu → Schedule Menu → Local Schedule

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Mon		UNCHECKED/CHECKED	UNCHECKED		RW
2	Tue		UNCHECKED/CHECKED	UNCHECKED		RW
3	Wed		UNCHECKED/CHECKED	UNCHECKED		RW
4	Thu		UNCHECKED/CHECKED	UNCHECKED		RW
5	Fri		UNCHECKED/CHECKED	UNCHECKED		RW
6	Sat		UNCHECKED/CHECKED	UNCHECKED		RW
7	Sun		UNCHECKED/CHECKED	UNCHECKED		RW
8	Hol		UNCHECKED/CHECKED	UNCHECKED		RW
9	Occupied from		00:00 to 24:00	00:00	hr:min	RW
10	[Occupied] to		00:00 to 24:00	00:00	hr:min	RW

NOTE: The Local Schedule menu has 8 pages, one page each for Periods 1 to 8. For more information about setting schedules, see the 19XR Start-Up, Operation, and Maintenance Instructions manual.

Ice Build Schedule

CCN TABLE NAME: MENUOCC2

PIC 5 PATH: Main Menu → Configuration Menu → Schedule Menu → Ice Build Schedule

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Mon		UNCHECKED/CHECKED	UNCHECKED		RW
2	Tue		UNCHECKED/CHECKED	UNCHECKED		RW
3	Wed		UNCHECKED/CHECKED	UNCHECKED		RW
4	Thu		UNCHECKED/CHECKED	UNCHECKED		RW
5	Fri		UNCHECKED/CHECKED	UNCHECKED		RW
6	Sat		UNCHECKED/CHECKED	UNCHECKED		RW
7	Sun		UNCHECKED/CHECKED	UNCHECKED		RW
8	Hol		UNCHECKED/CHECKED	UNCHECKED		RW
9	Occupied from		00:00 to 24:00	00:00	hr:min	RW
10	[Occupied] to		00:00 to 24:00	00:00	hr:min	RW
11	Timed Override Extension†			0	hr	RW

*Default value is shown only if configurable in this table.
†Period 8 only.

NOTE: The Ice Build Schedule menu has 8 pages, one page each for Periods 1 to 8. See the Ice Build Option section on page 27.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Network Schedule

CCN TABLE NAME: MENUOCC3

PIC 5 PATH: Main Menu → Configuration Menu → Schedule Menu → Network Schedule

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Mon		UNCHECKED/ CHECKED	UNCHECKED		RW
2	Tue		UNCHECKED/ CHECKED	UNCHECKED		RW
3	Wed		UNCHECKED/ CHECKED	UNCHECKED		RW
4	Thu		UNCHECKED/ CHECKED	UNCHECKED		RW
5	Fri		UNCHECKED/ CHECKED	UNCHECKED		RW
6	Sat		UNCHECKED/ CHECKED	UNCHECKED		RW
7	Sun		UNCHECKED/ CHECKED	UNCHECKED		RW
8	Hol		UNCHECKED/ CHECKED	UNCHECKED		RW
9	Occupied from		00:00 to 24:00	00:00	hr:min	RW
10	[Occupied] to		00:00 to 24:00	00:00	hr:min	RW
11	Timed Override Extension†			0	hr	RW

*Default value is shown only if configurable in this table.
†Period 8 only.

NOTE: The Network Schedule menu has 8 pages, one page each for Periods 1 to 8. For more information, see page 21.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Holiday Menu

Navigation: MAIN MENU → CONFIGURATION MENU → HOLIDAY MENU

The Holiday Menu has 16 submenus (HOLDY-01 to HOLDY_16), so it is possible to set 16 different holiday periods. For more information about holiday periods, see the Time Schedule section on page 27. Figure D below shows the Holiday Menu and a sample submenu.

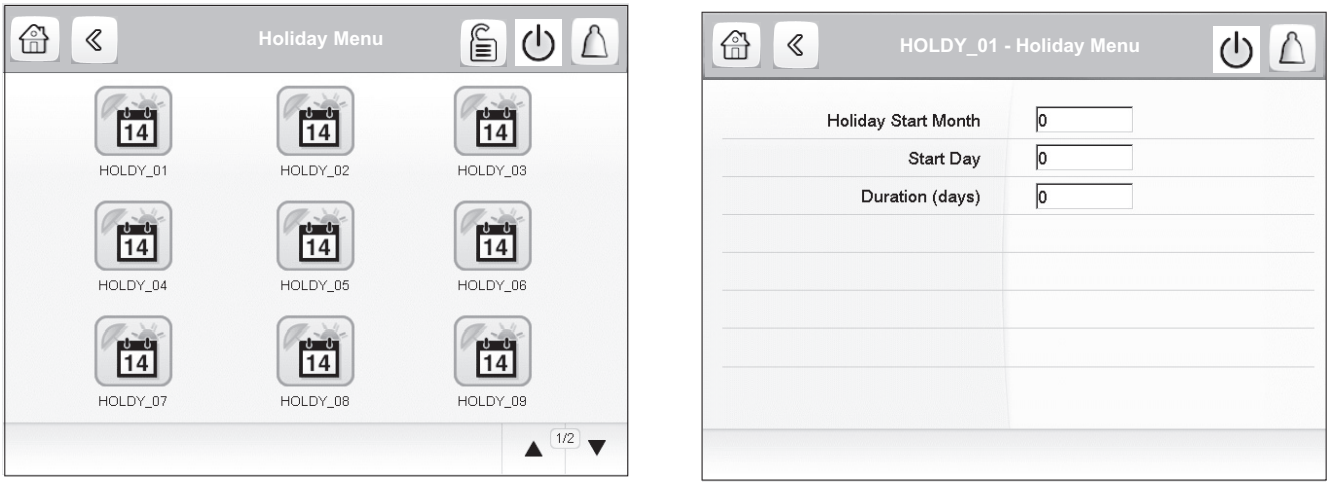


Fig. D — Holiday Menu and Submenu

Bacnet Config

CCN TABLE NAME: BACNET

PIC 5 PATH: Main Menu → Configuration Menu → BACnet Config

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	BACnet Enable	bacena	0 to 1	1		RW
2	Metric Unit	bacunit	0 to 1	1		RW
3	Network	network	1 to 9999	1601		RW
4	Identifier	Ident	0 to 9999999	1600001		RW

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

NOTES:
1. The BACnet network and the device object identifier can be modified. The default identifier has been choosen to easily recognize the Chiller on a BACnet network. The first two digits are the BACnet CARRIER vendor number (16). These parameters must be unique on the BACnet network. They must be modified if more than one Carrier chillers are connected to the BACnet network.
2. Changing one of these BACnet parameters will cause a reboot of the board after 1 minute.
3. Changing IP address from the PIC 5 SETUP menu will require a manual reboot or power cycle of the PIC 5 controller in order to re-build the BACnet stack.
4. For more information, see “APPENDIX D — BACnet OPTION” on page 98.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Maintenance Menu

Navigation: MAIN MENU → MAINTENANCE MENU

ICON	DISPLAYED TEXT	ACCESS	ASSOCIATED TABLE	PAGE NO.
	Capacity Control	Service	CAPACTRL	81
	Override Control	Service	OVERRIDE	82
	Surge Correction	Service	MAISURGE	83
	Maintenance ISM Config	Service	ISM_MCFG	83
	Swift Restart	Service	MAISWRST	84
	Master Slave	Service	MAIN_MS	84
	Power Parameters	Service	POWER	85
	ISM Status	Service	MAIISMC	86
	ISM History	Service	MAIISMH	86
	Maintenance SRD	Service	MAIN_SRD	87
	Last Power of Reset	Service	LAST_POR	—
	Maintenance Others	Service	MAIOTHER	87
	Maintenance IOB	Service	MAIIOB	88
	Board Software PN	Service	MAI_BDSN	88
	LEN Bus Comm Diag	Service	LEN_DBG	Control Use Only
	Pressure Sensor Calib	Service	PRES_CAL	90
	Pumpdown/Lockout	Service	PUMPDOWN	89

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Capacity Control

CCN TABLE NAME: CAPACTRL

PIC 5 PATH: Main Menu → Maintenance Menu → Capacity Control

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Total Error + Resets	tot_err			°F	RO
2	Control Point Error	ctrl_err			°F	RO
3	Controlled Water Temp	ctrl_wt			°F	RO
4	Control Point	ctrl_pnt			°F	RO
5	Actual Set Point	setpoint			°F	RO
6	Entering Water Change DT	ewt_dt			°F	RO
7	Enter Water Temp Reset	ewt_res			°F	RO
8	Leaving Water Temp Reset	lwt_res			°F	RO
9	Discharge Gas Temp Reset	dgt_res			°F	RO
10	Target GV1 Pos	gv1_tgt			%	RO
11	GV1 Pos Change Delta	gv1delta			%	RO
12	GV1 Change Flag	gv1_chg	0 to 2			RO
13	0 = Stop, 1 = Change, 2 = Cont					RO
14	VFD Speed Change Flag	vfd_chg	0 to 2			RO
15	0 = Stop, 1 = Change, 2 = Cont					RO
16	Target VFD Speed	vfd_tgt			%	RO
17	VFD Speed Change Delta	vfd_dlta				RO
18	Capacity Inhibit Flag	cap_inh	NO/YES			RO
19	Capacity Decrease Flag	cap_dec	NO/YES			RO
20	Condenser Water Delta T	cdw_dt			°F	RO
21	Chilled Water Delta T	chw_dt			°F	RO
22	Pulldown Set Point	pull_set			%	RO
23	Demand Limit Inh Clamp	deinhclm			%	RO
24	Ramping Demand Limit Val	ramp_dem	NO/YES			RO
25	Compressor is Running	comp_run	NO/YES			RO
26	Comp1 Run State Val	cm_stat1	0 to 14		%	RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Override Control

CCN TABLE NAME: OVERRIDE

PIC 5 PATH: Main Menu → Maintenance Menu → Override Control

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Cond Press Trip Value	cp_trip			psig	RO
2	Cond Press Override Flag	cpov_fl	NO/YES			RO
3	Low DSH Override Flag	dshov_fl	NO/YES			RO
4	Required DSH	dsh_req			°F	RO
5	High Lift Override Flag	lftov_fl	NO/YES			RO
6	Low SST Override Flag	sstov_fl	NO/YES			RO
7	High Motor Temp Over	mtov_fl	NO/YES			RO
8	High Bearing Temp Over	tbov_fl	NO/YES			RO
9	Evap Sat Override Temp	ert_over			°F	RO
10	DSH Increase Step	dshinstp			%	RO
11	DSH Decrease Step	dshdestp			%	RO
12	Low Sour Temp Over Flag	lstov_fl	NO/YES			RO
13	DGT Override Flag	dgtov_fl	NO/YES			RO
14	High Motor Current Flag	ampov_fl	NO/YES			RO
15	Capacity Inhibit Ramping	cap_inhr	NO/YES			RO
16	Capacity Inhibit Demand	cap_inhd	NO/YES			RO
17	Capacity Decrease Demand	cap_decd	NO/YES			RO
18	Capacity Inh Override	cap_inho	NO/YES			RO
19	Capacity Dec Override	cap_deco	NO/YES			RO
20	Capacity Inh Surge	cap_inhs	NO/YES			RO
21	Capacity Decrease Surge	cap_decs	NO/YES			RO
22	Capacity Inh Low SST	capinhst	NO/YES			RO
23	Capacity Dec Low SST	capdecst	NO/YES			RO
24	Capacity Inh High Lift	capinhlf	NO/YES			RO
25	Capacity Inh Cond Pres	capinhcp	NO/YES			RO
26	Capacity Dec Cond Pres	capdeccp	NO/YES			RO
27	Capacity Inh Motor Temp	capinhmt	NO/YES			RO
28	Capacity Dec Motor Temp	capdecmt	NO/YES			RO
29	Capacity Inh Hi Current	capinham	NO/YES			RO
30	Capacity Dec Hi Current	capdecam	NO/YES			RO
31	Capacity Dec Low Temp	capdecls	NO/YES			RO
32	Capacity Inh DSH	capinhsh	NO/YES			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Surge Correction

CCN TABLE NAME: MAISURGE

PIC 5 PATH: Main Menu → Maintenance Menu → Surge Correction

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Surge Region	act_reg	0 to 2			RO
2	0 = No, 1 = Low, 2 = High					
3	Active Delta Tsat	dts_act			° F	RO
4	Calc Ref Delta Tsat	dts_cal			°F	RO
5	Amps Change Surge Prot	amps_dta			%	RO
6	Max Amps Change Value	amch_max			%	RO
7	Surge Counts	sc				RO
8	Surge Prevention Active	surg_act	NO/YES			RO
9	Surge Protection Counts	spc				RO
10	Surge Protection Active	surg_pro	NO/YES			RO
11	HGBP Change Flag	hgbp_chg	0 to 2			RO
12	0 = Close, 1 = Hold, 2 = Open					
13	Cal Surge Delta Tsmax	dts_maxc	0 to 150.0		°F	RO
14	Cal Surge Delta Tsmin	dts_minc	0 to 150.0		°F	RO
15	Cal Surge Delta Tsmed					
16	IGV Full Load Position		90.0 to120.0		%	RO
17	IGV Minimum Position		0.0 to 10.0		%	RO
18	Opti-Sound IGV1 Position				%	RO
19	Optimized Envelope Line		NO/YES			RO

Maintenance ISM Config

CCN TABLE NAME: ISM_MCFG

PIC 5 PATH: Main Menu → Maintenance Menu → Maintenance ISM Config

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	ISM Config Conflict	ism_cflt	NO/YES		—	RO
2	Delete ISM Config	del_ismc	NO/YES	NO	—	RW
3	Communication Timeout	com_tout	0 to 255		sec	RO
4	Starter Type	star_typ	0 to 3		—	RO
5	0=Full Volt, 1=Redu Volt					
6	2=Solid State, 3=FS VFD					
7	Single Cycle Dropout	scycd_en	DSABLE/ENABLE		—	RO
8	Motor Rated Load Amps	rla	10 to 5000		amp	RO
9	Motor Locked Rotor Trip	mot_lra	100 to 65535		amp	RO
10	Locked Rotor Start Delay	lrs_del	1 to 10		cycles	RO
11	Starter LRA Rating	str_lra	100 to 65535		amp	RO
12	Motor Rated Line Voltage	rlv	200 to 13800		V	RO
13	Current Imbal Threshold	cu_th	5 to 100		%	RO
14	Voltage Imbal Threshold	vu_th	1 to 10		%	RO
15	Motor Current CT Ratio:1	ct_ratio	3 to 1000		—	RO
16	Volt Transformer Ratio:1	vt_rat	1 to 115		—	RO
17	Current Imbal Persist	cu_per	1 to 10		sec	RO
18	Voltage Imbal Persist	vu_per	1 to 10		sec	RO
19	Line Frequency Faulting	lfref_en	DSABLE/ENABLE		—	RO
20	Frequency=60 Hz?(No=50)	linefreq	NO/YES		—	RO
21	Ground Fault Protection	gfp_en	DSABLE/ENABLE		—	RO
22	Ground Fault Current	gf_amps	1 to 25		amp	RO
23	Ground Fault Persistence	gfp_pers	1 to 10		cycles	RO
24	Ground Fault Start Delay	gfs_del	1 to 20		cycles	RO
25	Ground Fault CT Ratio:1	gfct_rat	150 to 150		—	RO
26	Overvoltage Threshold	ovvol_th	105 to 115		%	RO
27	Undervoltage Threshold	udvol_th	85 to 95		%	RO
28	Over Under Volt Persist	ovud_per	1 to 10		sec	RO
29	Under Volt Start Delay	uvs_del			sec	RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Swift Restart

CCN TABLE NAME: MAISWRST

PIC 5 PATH: Main Menu → Maintenance Menu → Swift Restart

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	SRD Position @Shutdown	srd_shut	0 to 100		%	RO
2	VFD Speed @Shutdown	vfd_shut	0 to 100		%	RO
3	GV1 Position @Shutdown	gv1_shut	0 to 100		%	RO
4	Evap Sat Temp @Shutdown	est_shut	–40 to 280		°F	RO
5	Power Recovery Duration	pd_dur	0 to 1		min	RO
6	Power Down Active	power_dn	NO/YES		—	RO
7	Auto Restart Active	auto_rst	NO/YES		—	RO
8	Swift Restart Active	sw_rst	NO/YES		—	RO

Master Slave

CCN TABLE NAME: MAIN_MS

PIC 5 PATH: Main Menu → Maintenance Menu → Master Slave

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Unit is Lead or Lag 0 = Disable 1 = Lead 2 = Lag	lead_lag	0 to 2			RO
2	Master Control Type 0 = Local 1 = Network 2 = Remote 3 = Local Sched	ms_ctrl	0 to 3			RO
3	Slave Control Type 0 = Local 1 = Network 2 = Remote 3 = Local Sched	sl_ctrl	0 to 3			RO
4	Lead Lag Communication	ll_comm	TRUE/FALSE			RO
5	Lead Lag Chiller Fault 0 = No 1 = Lead 2 = Lag 3 = Both	ll_fault	0 to 3			RO
6	Slave Run Status	lagstat	0 to 14			RO
7	Slave Start/Stop	lag_s_s	START/STOP			RO
8	Capacity Decrease	CAP_DECL	NO/YES			RO
9	Capacity Inhibit	CAP_INHL	NO/YES			RO
10	Master Chiller Running	MST_RUN	NO/YES			RO
11	EWT Control Option		DSABLE/ENABLE			RO
12	Demand Limit Source		0 to 1			RO
13	Lag Start Timer	lagstart	0 to 60		min	RO
14	Lag Stop Timer	lagstop	0 to 60		min	RO
15	Prestart Fault Timer	prefIt	0 to 30		min	RO
16	Pulldown Timer	pulltime	0 to 30		min	RO
17	Pulldown: Delta T / Min	pull_dt	0 to 100		°F	RO
18	Lead/Lag Hours Delta	ll_hr_d	–99999 to 99999		hours	RO
19	Overrid Control Point	ctrpntov	10 to 160.0		°F	RO
20	Overrid Act Demand Limit	demlimov	10 to 100.0		%	RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Power Parameters

CCN TABLE NAME: POWER

PIC 5 PATH: Main Menu → Maintenance Menu → Power Parameters

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Line Current Phase 1	LN_AMPS1			amp	RO
2	Line Current Phase 2	LN_AMPS2			amp	RO
3	Line Current Phase 3	LN_AMPS3			amp	RO
4	Actual Line Current	AMPS_A			amp	RO
5	Percent Load Current	AMPS_P			%	RO
6	Ground Fault Phase 1	GRFT_1			amp	RO
7	Ground Fault Phase 2	GRFT_2			amp	RO
8	Ground Fault Phase 3	GRFT_3			amp	RO
9	Line Voltage Phase 1	LN_VOLT1			V	RO
10	Line Voltage Phase 2	LN_VOLT2			V	RO
11	Line Voltage Phase 3	LN_VOLT3			V	RO
12	Actual Line Voltage	VOLT_A			V	RO
13	Percent Line Voltage	VOLT_P			%	RO
14	Motor Kilowatts	KW			kW	RO
15	Motor Percent Kilowatts	KW_P			%	RO
16	Motor Kilowatts Hours	KWH			kW	RO
17	Line Frequency	LN_FREQ			Hz	RO
18	Power Factor	POW_FACT				RO
19	Motor Actual Frequency	MOT_FREQ			Hz	RO
20	VFD Load Factor	VFD_FACT				RO
21	VFD Load Current	VFD_LOAD			amp	RO
22	High VFD Current	VFDC_HI	NO/YES			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

ISM Status

CCN TABLE NAME: MAIISMC

PIC 5 PATH: Main Menu → Maintenance Menu → ISM Status

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Single Cycle Dropout	cycle_1	NO/YES			RO
2	Phase Loss	ph_loss	NO/YES			RO
3	Over Voltage	ov_volt	NO/YES			RO
4	Under Voltage	un_volt	NO/YES			RO
5	Current Imbalance	amp_unb	NO/YES			RO
6	Voltage Imbalance	volt_unb	NO/YES			RO
7	Overload Trip	overload	NO/YES			RO
8	Locked Rotor Trip	lratrip	NO/YES			RO
9	Starter LRA Trip	slratrip	NO/YES			RO
10	Ground Fault	grnd_flt	NO/YES			RO
11	Phase Reversal	ph_rev	NO/YES			RO
12	Frequency Out of Range	freqflt	NO/YES			RO
13	ISM Power On Reset	ism_por	NO/YES			RO
14	Phase 1 Fault	phase_1	NO/YES			RO
15	Phase 2 Fault	phase_2	NO/YES			RO
16	Phase 3 Fault	phase_3	NO/YES			RO
17	1CR Start Complete	start_ok	NO/YES			RO
18	1M Start/Run Fault	1m_flt	NO/YES			RO
19	2M Start/Run Fault	2m_flt	NO/YES			RO
20	Pressure Trip Contact	prs_trip	NO/YES			RO
21	Starter Fault	strt_flt	NO/YES			RO
22	Motor Amps Not Sensed	no_amps	NO/YES			RO
23	Starter Accel Fault	accelflt	NO/YES			RO
24	High Motor Amps	highamps	NO/YES			RO
25	1CR Stop Complete	stop_ok	NO/YES			RO
26	1M/2M Stop Fault	1m2mstop	NO/YES			RO
27	Motor Amps When Stopped	ampstop	NO/YES			RO
28	Hardware Failure	hardware	NO/YES			RO
29	Calibration Factor Error	calfc_er	NO/YES			RO
30	Invalid Configuration	conf_err	NO/YES			RO
31	Unused	un_used	NO/YES			RO

ISM History

CCN TABLE NAME: MAIISMH

PIC 5 PATH: Main Menu → Maintenance Menu → ISM History

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Line Current Phase 1	AMPS_H1			amp	RO
2	Line Current Phase 2	AMPS_H2			amp	RO
3	Line Current Phase 3	AMPS_H3			amp	RO
4	Line Frequency	FREQ_H			Hz	RO
5	Ground Fault Phase 3	GRFT_H1			amp	RO
6	Ground Fault Phase 2	GRFT_H2			amp	RO
7	Ground Fault Phase 1	GRFT_H3			amp	RO
8	Phase 1 Faulted	phase_h1	NO/YES			RO
9	Phase 2 Faulted	phase_h2	NO/YES			RO
10	Phase 3 Faulted	phase_h3	NO/YES			RO
11	12T Sum Heat Phase 1	sum1ht_h			%	RO
12	12T Sum Heat Phase 2	sum2ht_h			%	RO
13	12T Sum Heat Phase 3	sum3ht_h			%	RO
14	Line Voltage Phase 1	VOLT_H1			V	RO
15	Line Voltage Phase 2	VOLT_H2			V	RO
16	Line Voltage Phase 3	VOLT_H3			V	RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Maintenance SRD

CCN TABLE NAME: MAIN_SRD

PIC 5 PATH: Main Menu → Maintenance Menu → Maintenance SRD

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Diffuser Target Pos	diff_tgt			%	RO
2	Diffuser Fault	diffault	NO/YES			RO
3	SRD Rotating Stall Alarm	diff_alm	NO/YES			RO
4	Calculated SRD Position	srd_a			%	RO
5	Calc High Lift SRD Pos	srd_1			%	RO
6	Calc Low Lift SRD Pos	srd_2			%	RO
7	Calc Actual Lift	lift_a			°F	RO
8	VDO High Lift Load Line	lift_1			°F	RO
9	VDO Low Lift Load Line	lift_2			°F	RO
10	VDO Logic Start Delay	strt_tmr			min	RO
11	SRD Stall Closure Time	stalltmr			min	RO

Maintenance Others

CCN TABLE NAME: MAIOTHER

PIC 5 PATH: Main Menu → Maintenance Menu → Maintenance Others

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	5V Sensor Power Monitor	tran_v			V	RO
2	Evap Pres Trans Volts	evapp_v			V	RO
3	Cond Pres Trans Volts	condp_v			V	RO
4	Econ Pres Trans Volts	econp_v			V	RO
5	Diffuser Pres Tran Volts	diffp_v			V	RO
6	Oil Sump Pres Tran Volts	opsmp_v			V	RO
7	Oil Sup Pres Trans Volts	opdis_v			V	RO
8	Evap Enter Water Volts	evewp_v			V	RO
9	Evap Leave Water Volts	evlwp_v			V	RO
10	Cond Enter Water Volts	cdewp_v			V	RO
11	Cond Leave Water Volts	cdlwp_v			V	RO
12	Prestart Check Status	pre_chck	NO/YES			RO
13	GV1 Pos at Startup OK	gvpos_ok	NO/YES			RO
14	OIL PD at Startup OK	oilpd_ok	NO/YES			RO
15	HGBP Pos at Startup OK	hgbp_ok	NO/YES			RO
16	Damper at Startup OK	dmp_ok	NO/YES			RO
17	Oil Pump Req Oil Heater	op_heat	NO/YES			RO
18	Oil Pump Req Prestart	op_prest	NO/YES			RO
19	Oil Pump Req Startup	op_start	NO/YES			RO
20	Oil Pump Req Shutdown	op_shut	NO/YES			RO
21	Oil Pump Req Swift Rst	op_srst	NO/YES			RO
22	Evap Pump Req Startup	ep_start	NO/YES			RO
23	Evap Pump Req Diagnostic	ep_diag	NO/YES			RO
24	Evap Pump Req Freeze	ep_freze	NO/YES			RO
25	Evap Pump Req Shutdown	ep_shut	NO/YES			RO
26	Evap Pump Req Pumpdown	ep_pdown	NO/YES			RO
27	Cond Pump Req Prestart	cp_prest	NO/YES			RO
28	Cond Pump Req Startup	cp_start	NO/YES			RO
29	Cond Pump Req Override	cp_overr	NO/YES			RO
30	Cond Pump Req Shutdown	cp_shut	NO/YES			RO
31	Cond Pump Req Tower	cp_tower	NO/YES			RO
32	Cond Pump Req Diagnostic	co_diag	NO/YES			RO
33	Cond Pump Req Freeze	cp_freze	NO/YES			RO
34	Cond Pump Req Pumpdown	cp_pdown	NO/YES			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Maintenance IOB

CCN TABLE NAME: MAIIOB

PIC 5 PATH: Main Menu → Maintenance Menu → Maintenance IOB

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	IOB1 Power Supply Volt	vol_iob1			V	RO
2	IOB1 Num Peak Prev Sec	nm_peak1				RO
3	IOB1 Low Voltage Flag	low_vol1	NO/YES			RO
4	IOB1 24VAC Fuse Status	fusstat1	CLOSE/OPEN			RO
5	IOB2 Power Supply Volt	vol_iob2			V	RO
6	IOB2 Num Peak Prev Sec	nm_peak2				RO
7	IOB2 Low Voltage Flag	low_vol2	NO/YES			RO
8	IOB2 24VAC Fuse Status	fusstat2	CLOSE/OPEN			RO
9	IOB3 Power Supply Volt	vol_iob3			V	RO
10	IOB3 Num Peak Prev Sec	nm_peak3				RO
11	IOB3 Low Voltage Flag	low_vol3	NO/YES			RO
12	IOB3 24VAC Fuse Status	fusstat3	CLOSE/OPEN			RO
13	IOB4 Power Supply Volt	vol_iob4			V	RO
14	IOB4 Num Peak Prev Sec	nm_peak4				RO
15	IOB4 Low Voltage Flag	low_vol4	NO/YES			RO
16	IOB4 24VAC Fuse Status	fusstat4	CLOSE/OPEN			RO
17	IOB5 Power Supply Volt	vol_iob5			V	RO
18	IOB5 Num Peak Prev Sec	nm_peak5				RO
19	IOB5 Low Voltage Flag	low_vol5	NO/YES			RO
20	IOB5 24VAC Fuse Status	fusstat5	CLOSE/OPEN			RO
21	IOB6 Power Supply Volt	vol_iob6			V	RO
22	IOB6 Num Peak Prev Sec	nm_peak6				RO
23	IOB6 Low Voltage Flag	low_vol6	NO/YES			RO
24	IOB6 24VAC Fuse Status	fusstat6	CLOSE/OPEN			RO

Board Software PN

CCN TABLE NAME: MAI_BDSN

PIC 5 PATH: Main Menu → Maintenance Menu → Board Software PN

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	IOB #1 Soft Part Number	sn_iob1	8 chars			RO
2	IOB #2 Soft Part Number	sn_iob2	8 chars			RO
3	IOB #3 Soft Part Number	sn_iob3	8 chars			RO
4	IOB #4 Soft Part Number	sn_iob4	8 chars			RO
5	IOB #5 Soft Part Number	sn_iob5	8 chars			RO
6	IOB #6 Soft Part Number	sn_iob6	8 chars			RO
7	ISM Software Part Number	sn_ism	8 chars			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Pumpdown/Lockout (Screen 1)

Navigation: MAIN MENU → MAINTENANCE MENU → PUMPDOWN/LOCKOUT

The control supports the use of an external means to pump the refrigerant from the evaporator to the condenser for service purposes.

Upon entering Pumpdown, the following message is displayed:

PUMPDOWN REQUESTED
WARNING:
Observe Freeze-Up Precautions
While Using External Pumpout
To Remove Charge

Yes to Continue?

If the user presses YES, the following message is displayed:

PUMPDOWN REQUESTED
Close Isolation Valves If Installed
Yes To Start Water Pumps?

If the user presses YES, the pumps are activated and the following message is displayed:

PUMPDOWN REQUESTED
Chilled Water and Condenser
Water Pumps Are ON
Waiting For Flow Confirmation

If both flows are not confirmed before the WATER FLOW VERIFY TIME, then both pumps are de-energized and the following message will be displayed:

PUMPDOWN TERMINATED
Chilled Water Flow Failure
Condenser Water Flow Failure

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Pressure Sensor Calib (PRES_CAL) Menu Description

Navigation: MAIN MENU → MAINTENANCE MENU → PRESSURE SENSOR CALIB

ICON	DISPLAYED TEXT	ACCESS	ASSOCIATED TABLE	PAGE NO.
	Evap Pressure Sensor	Service	PRSCAL01	91
	Cond Pressure Sensor	Service	PRSCAL02	91
	Eco Pressure Sensor	Service	PRSCAL03	91
	Diff Pressure Sensor	Service	PRSCAL04	91
	Oil Sump Pressure	Service	PRSCAL05	92
	Oil Supply Pressure	Service	PRSCAL06	92
	Evap Entering Water P	Service	PRSCAL07	92
	Evap Leaving Water P	Service	PRSCAL08	92
	Cond Entering Water P	Service	PRSCAL09	93
	Cond Leaving Water P	Service	PRSCAL10	93

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Evap Pressure Sensor

CCN TABLE NAME: PRSCAL01

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Evap Pressure Sensor

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Evap Pressure Sensor					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

Cond Pressure Sensor

CCN TABLE NAME: PRSCAL02

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Cond Pressure Sensor

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Cond Pressure Sensor					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

Eco Pressure Sensor

CCN TABLE NAME: PRSCAL03

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Eco Pressure Sensor

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Eco Pressure Sensor					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

Diff Pressure Sensor

CCN TABLE NAME: PRSCAL04

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Diff Pressure Sensor

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Diff Pressure Sensor					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Oil Sump Pressure

CCN TABLE NAME: PRSCAL05

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Oil Sump Pressure

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Oil Sump Pressure					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s		0		RO
7	Calibrated Intercept	cal_i		0		RO
8	Calibration Completed	cal_st	0 to 1	0		RO

Oil Supply Pressure

CCN TABLE NAME: PRSCAL06

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Oil Supply Pressure

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Oil Supply Pressure					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

Evap Entering Water P

CCN TABLE NAME: PRSCAL07

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Evap Entering Water P

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Evap Entering Water P					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

Evap Leaving Water P

CCN TABLE NAME: PRSCAL08

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Evap Leaving Water P

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Evap Leaving Water P					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

LEGEND

RO — Read Only
RW — Read/Write

*Default value is shown only if configurable in this table.

Cond Entering Water P

CCN TABLE NAME: PRSCAL09

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Cond Entering Water P

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Cond Entering Water P					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

Cond Leaving Water P

CCN TABLE NAME: PRSCAL10

PIC 5 PATH: Main Menu → Maintenance Menu → Pressure Sensor Calib → Cond Leaving Water P

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Cond Leaving Water P					
2	Calibration Enable	cal_en	DSABLE/ENABLE	DSABLE		RW
3	Current Pressure	cur_pres			psig	RO
4	Calib Press1(0 PSI)	cal_p1	9 digit numeric string	0	psig	RW
5	Calib Press2 (100-250PSI)	cal_p2	9 digit numeric string	0	psig	RW
6	Calibrated Slope	cal_s				RO
7	Calibrated Intercept	cal_i				RO
8	Calibration Completed	cal_st	0 to 1			RO

LEGEND

*Default value is shown only if configurable in this table.

RO — Read Only
RW — Read/Write

APPENDIX A — PIC 5 SCREEN AND TABLE STRUCTURE (cont)

Alarms Menu Description

ICON	DISPLAYED TEXT	ACCESS	ASSOCIATED TABLE	PAGE NO.
	Reset Alarms	All	ALARMRST	94
	Current Alarms	All	CUR_ALM	
	History Alarms	All	ALMHIST1	

Alarm Reset

CCN TABLE NAME: ALARMRST

PIC 5 PATH: Main Menu → Alarm Menu → Alarm Reset

LINE	PIC 5 DESCRIPTION	CCN NAME	RANGE	DEFAULT VALUE*	UNIT	READ/WRITE
1	Alarm Reset	RST_ALM	0 to 1	0		RW
2	Alarm State	ALM_STAT				RO
3	Current Alarm 1	alarm_1c				RO
4	Current Alarm 2	alarm_2c				RO
5	Current Alarm 3	alarm_3c				RO
6	Current Alarm 4	alarm_4c				RO
7	Current Alarm 5	alarm_5c				RO
8	Jbus Current Alarm 1	alarm_1				RO
9	Jbus Current Alarm 2	alarm_2				RO
10	Jbus Current Alarm 3	alarm_3				RO
11	Jbus Current Alarm 4	alarm_4				RO
12	Jbus Current Alarm 5	alarm_5				RO

LEGEND

RO — Read Only
RW — Read/Write

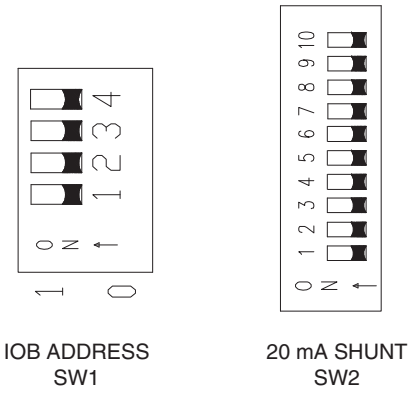
*Default value is shown only if configurable in this table.

NOTE: For more information about viewing and resetting alarms, see the Diagnostics and Troubleshooting section on page 30.

APPENDIX B — INPUT/OUTPUT BOARD (IOB) AND HUMAN MACHINE INTERFACE (HMI) DIP SWITCH SETTINGS

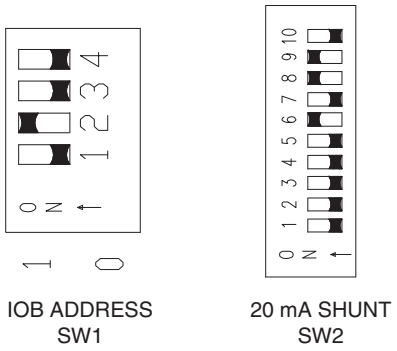
IOB Dip Switch Settings (Fig. E)

IOB	SW1 SETTING (1 TO 4)	SW2 SETTING (1 TO 10)
IOB-1	0000	0000000000
IOB-2	1000	0000000110
IOB-3	0100	0000010110
IOB-4	1100	1100000000



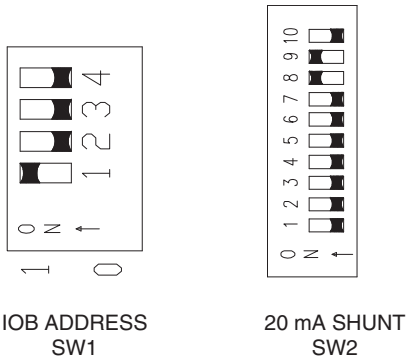
IOB ADDRESS SW1 — 20 mA SHUNT SW2

IOB-1 Dip Switch Settings



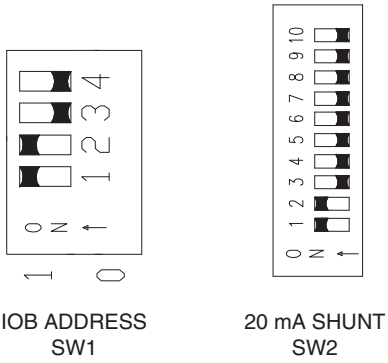
IOB ADDRESS SW1 — 20 mA SHUNT SW2

IOB-3 Dip Switch Settings



IOB ADDRESS SW1 — 20 mA SHUNT SW2

IOB-2 Dip Switch Settings



IOB ADDRESS SW1 — 20 mA SHUNT SW2

IOB-4 Dip Switch Settings

Fig. E — IOB Dip Switch Settings

APPENDIX B — INPUT/OUTPUT BOARD (IOB) AND HUMAN MACHINE INTERFACE (HMI) DIP SWITCH SETTINGS (cont)

HMI Dip Switch Settings — To access switches, remove the access cover on the back of the HMI panel. See Fig. F.

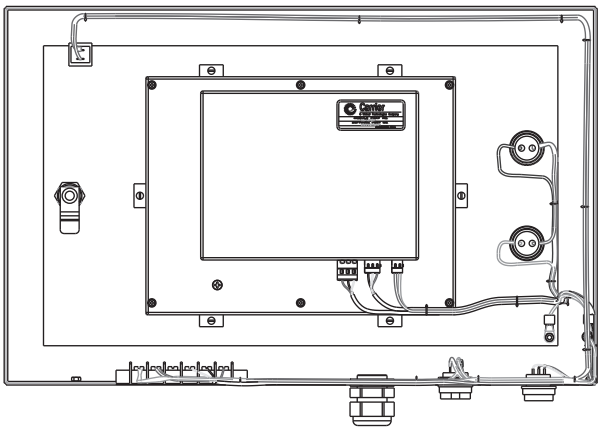


Fig. F — HMI Access Cover

APPENDIX C — INPUT/OUTPUT BOARD (IOB) STATUS INDICATORS

All control boards have LED indicators that show control board and communication status.

A red LED on each control module operates in the following manner:

- Power not present or power supply failure: LED is off
- Power present but microprocessor in Reset: LED is off
- Microprocessor operational but not communicating: LED flashes 3 seconds on, 3 seconds off
- Microprocessor operational and communicating with control system: LED flashes at 0.5 Hz rate (1 second on, 1 second off) in sync (±100 ms) with all other new control modules on the same communication bus
- Microprocessor in boot mode: LED flashes at 0.2 seconds on, 0.2 seconds off)

Each independent communication port has a green status LED. The green LED is on when data is being transmitted by the board.

APPENDIX D — BACnet OPTION

General — The 19XR PIC 5 controller supports the BACnet protocol as B-ASC BACnet equipment over IP. In addition, BACnet on the PIC 5 controller supports the following features:

- Optional properties such as Change of Value (COV), Intrinsic Reporting, and Commandable properties on some objects.
- The generation of limited alarm and event notifications and the ability to direct them to recipients
- The tracking of acknowledgments of alarms from human operators
- The adjustment of alarm parameters
- Read/write property for many services

Installing the BACnet Dongle — The BACnet option can be implemented at the factory or on-site. This section is intended for on-site installation.

It is strongly recommended to disconnect the complete power supply before any intervention. Disconnect the main power supply with appropriate disconnect devices. Only personnel qualified to the level recommended in standard IEC 60364 (International Electrotechnical Commission) and trained to do this may have access to electrical components.

⚠ CAUTION

The components that make up the chiller controller include electronic components. These may generate or be damaged by electromagnetic interference such as electrostatic discharge (ESD).

Technicians who do not have access to an ESD wrist strap on site should follow these recommendations in order to minimize the risk of ESD:

- Be sure to be at zero potential by touching an unpainted surface on the electrical box.
- Do not wear clothing that tends to conduct electrical charge, such as a wool sweater.
- Electrical storms can increase the ESD risk; unless absolutely necessary, do not work on the chiller controller during an electrical storm.

MOUNTING THE BACNET DONGLE — Follow these steps to mount the BACnet dongle in the PIC 5 control box:

1. Disconnect the PIC 5 control power supply.
2. Open the metal cover of the control box with a screwdriver. See Fig. H and I.

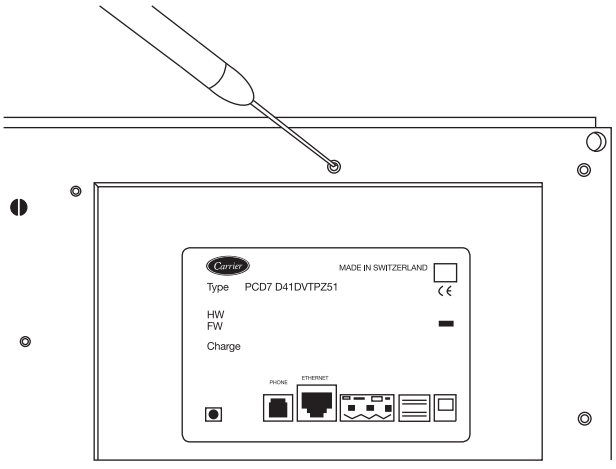


Fig. H — Opening Cover

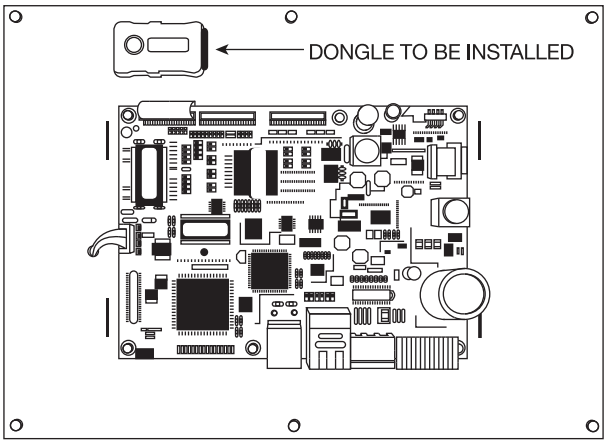


Fig. I — Cover Removed

3. Insert the BACnet dongle into the connector. See Fig. J.

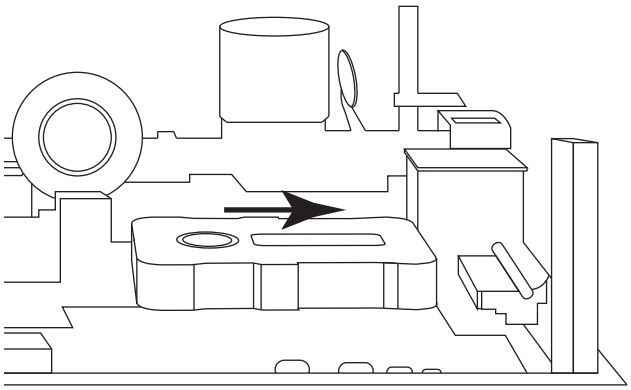


Fig. J — Inserting BAcNET Dongle

4. Mount the plastic holder that holds the dongle to the board. See Fig. K.

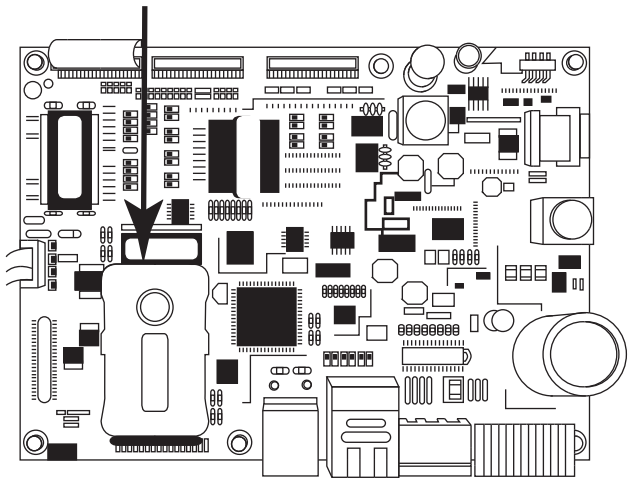


Fig. K — Mounting Plastic Holder

5. Close the box and power up the PIC 5 controller.

TESTING THE INSTALLATION — To verify that the dongle connection is correctly inserted and detected by the equipment, with the controller powered up, go to the PIC 5 Main Menu → Inputs Status and confirm that the BACnet Dongle status is Yes.

BACnet Settings — BACnet settings are available on the Main Menu → Configuration Menu → BACnet Config. The menu requires the Advanced User password for access. For details, see the Bacnet Config table on page 79.

BACnet Objects — The 19XR PIC 5 contains up to 500 BACnet objects. They can be of ANALOG_VALUE (AV) or BINARY_VALUE (BV) type. Objects name are built from CCN table name and CCN point name concatenated in order to recognize them easily. For a detailed list, see the BACnet Points table beginning on page 100.

In general, the equipment configuration parameters are available as Read Only. Set point parameters are available in Read-Write access.

Compressor status is ASCII-coded. In order to obtain the status from BACnet, statuses are assigned a BACnet code as shown in Table A.

Table A — Equipment Status

BACNET CODE	TEXT
0	Off
1	Control Test
2	Pumpdown
3	Lockout
4	Recycle
5	Tripout
6	Timeout
7	Prestart
8	Prestart
9	Startup
10	Autorst
11	Ramping
12	Running
13	Override
14	Demand
15	Shutdown

Alarm states are coded as shown in Table B.

Table B — Alarm States

BACNET CODE	CCN CODE
0	Normal
1	Partial (Alert)
2	Shutdown (Alarm)

Modifying the Unit IP Address — Note that changing IP address from the PIC 5 SETUP menu will require a manual reboot or power cycle of the PIC 5 controller in order to re-build the BACnet stack. For detailed instructions, see the Unit IP Address section on page 52.

BACnet IP Communication Problems — If the unit does not respond to the building management system, possible causes include the following:

- The BACnet dongle is not detected by the chiller application.
- The Ethernet cable is not correctly connected.
- Network parameters are not correct (see the Ethernet/IP Connection Problems section on page 56).
- There is an IP router between the equipment and the buildign management system.
- BACnet Enable parameter in the PIC 5 Configuration Menu is set to No.

To troubleshoot problems, try these measures:

- Open the metal casing of the 19XR PIC 5 controller and verify that the blue BACnet dongle is correctly connected.
- On the Ethernet connector, verify that the green LED is ON and the orange LED is blinking
- Open a command window under Windows (Start, Execute, type **cmd** and press Enter), type the command **ping** followed by the equipment IP address. The equipment must respond.
- Open 19XR PIC 5 Configuration Menu (Service password required) and check BACnet parameters.
- Use the free software called BDT (BACnet Discovery Tool) available on the internet (search *bacnet bdt*) and install it on the PC. All equipment connected to the BACnet network will respond to the “Who Is” command sent by this tool. Find the equipment configured with the BACnet device instance (1600001 for Carrier equipment).

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Active Delta Tsat	RO	°F	0.0		AV:114	MAISURGE_dts_act
Active Demand Limit	RO				AV:22	GENUNIT_DEM_LIM_rd
Active Demand Limit	RW	%	10.0	10.0 to 100.0	AV:350	GENUNIT_DEM_LIM_wr
Actual Guide Vane 1 Pos	RO	%	0.00		AV:66	INPUTS_GV1_ACT
Actual Line Current	RO	amp	0.0		AV:128	POWER_AMPS_A
Actual Line Voltage	RO	V	0.0		AV:136	POWER_VOLT_A
Actual Setpoint	RO	°F	45.0	10.0 to 150.0	AV:20	GENUNIT_setpoint
Actual VFD Speed	RO	%		0.00	AV:67	INPUTS_VFD_ACT
Alarm Relay	RO		ON	OFF/ON	BV:26	OUTPUTS_ALM
Alarm Reset	RO		0	0 to 1	BV:46	ALARMRST_RST_ALM
Alarm State	RO				AV:104	ALARMRST_ALM_STAT
Alert Relay	RO		ON	OFF/ON	BV:27	OUTPUTS_ALE
Amps Change Surge Prot	RO	%	0.0		AV:116	MAISURGE_amps_dta
Amps or KW Ramp Per Min	RO	%	10.0	5 to 20	AV:241	SERVICE1_ldramprt
Atmospheric Pressure	RO	psi	14.5000	8.000 to 15.000	AV:267	CFGSURGE_atom_pre
Auto Demand Limit Input	RO	mA	0.0		AV:69	INPUTS_AUTO_DEM
Auto Restart Active	RO		NO	NO/YES	BV:71	MAISWRST_auto_rst
Auto Restart Option	RO		DSABLE	DSABLE/ENABLE	BV:90	CONF_OPT_astart
Auto Water Temp Reset	RO	mA	0.0		AV:70	INPUTS_AUTO_RES
BACnet Dongle	RO		NO	NO/YES	BV:25	INPUTS_bacdongl
BACnet Enable	RO		1	0 to 1	BV:100	BACNET_bacena
Base Demand Limit	RW	%	100.0	10.0 to 100.0	AV:348	SETPOINT_dem_base
Bearing Degradation	RO	°F	200	100 to 230	AV:340	CONF_PRG_beart_th
Cal Surge Delta Tsmax	RO		0.0	0.0 to 150.0	AV:123	MAISURGE_dts_maxc
Cal Surge Delta Tsmax	RO	^F	70.0	0.0 to 150.0	AV:253	CFGSURGE_dts_max
Cal Surge Delta Tsmin	RO		0.0	0.0 to 150.0	AV:124	MAISURGE_dts_minc
Cal Surge Delta Tsmin	RO	^F	45.0	0.0 to 150.0	AV:254	CFGSURGE_dts_min
Calc Actual Lift	RO	^F	0.0	0.0 to 200.0	AV:47	TEMP_LIFT_A
Calc Actual Lift	RO	^F	0.0		AV:163	MAIN_SRD_lift_a
Calc High Lift SRD Pos	RO	%	0.0		AV:161	MAIN_SRD_srd_1
Calc Low Lift SRD Pos	RO	%	0.0		AV:162	MAIN_SRD_srd_2
Calc Ref Delta Tsat	RO	°F	–0.8		AV:115	MAISURGE_dts_cal
Calculated SRD Position	RO	%	0.0		AV:160	MAIN_SRD_srd_a
Capacity Decrease	RO		0	0 to 1	BV:78	MAIN_MS_CAP_DECL
Capacity Decrease Flag	RO	^F	0		BV:48	CAPACTRL_cap_dec
Capacity Inhibit	RO		0	0 to 1	BV:79	MAIN_MS_CAP_INHL
Capacity Inhibit Flag	RO		NO	NO/YES	BV:47	CAPACTRL_cap_inh
Chill Water Pulldown/Min	RO	^F	0.0	–20 to 20.0	AV:92	HYDRLIC_chw_pull
Chilled Medium	RO		WATER	WATER/BRINE	AV:215	FACTORY_chmedium
Chilled Water Delta P	RO	psig	0.0	–6.7 to 420.0	AV:91	HYDRLIC_chw_pd

LEGEND

AV — Analog Value
BV — Binary Value
RO — Read Only
RW — Read Write

*Object names are built from CCN table name and CCN point name combined for easy recognition.

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Chilled Water Flow	RO		NO	NO/YES	BV:43	HYDRLIC_CHW_FLOW
Chilled Water Pump	RO		OFF	OFF/ON	BV:41	HYDRLIC_CHWP
Chiller Connection Type 0=Parallel, 1=Series	RO		0	0 to 1	AV:323	CONF_MS_ms_type
Chiller Lockout	RO		OPEN	OPEN/CLOSE	BV:20	INPUTS_REM_LOCK
Chiller Run Status OFF=0,Ready=1,ON=2	RO		0	0 to 2	AV:24	GENUNIT_ch_stat
Chiller State Number	RO		300	0 to 500	AV:23	GENUNIT_ch_state
Chiller Status Output mA	RO	mA	8.0	4.0 to 20.0	AV:79	OUTPUTS_CHST_OUT
Chiller Type NGC=0,Legacy=1	RO		0	0 to 1	AV:209	FACTORY_chil_typ
Common Sensor Option	RO		DSABLE	DSABLE/ENABLE	BV:91	CONF_OPT_commsens
Communication Timeout	RO	sec	60	0 to 255	AV:168	ISM_MCFG_com_tout
Comp (Single=0,Dual=1)	RO		0	0 to 1	AV:213	FACTORY_comp_typ
Comp Bearing Temp Alert	RO	°F	175	155 to 175	AV:282	CFGLIMIT_tb_alert
Comp Bearing Temp Trip	RO	°F	185	175 to 185	AV:283	CFGLIMIT_tb_trip
Comp Discharge Alert	RO	°F	200	125 to 200	AV:278	CFGLIMIT_dgt_alrt
Comp Discharge Temp	RO	°F	0.0	–40.0 to 245	AV:34	TEMP_DGT
Comp Frequency 100%	RO	Hz	50.0	45.0 to 62.0	AV231	CONF_VFD_comp_100
Comp Motor Temp Override	RO	°F	200	150 to 200	AV:281	CFGLIMIT_mt_over
Comp Motor Wind 1 Temp	RO	°F	0.0	–40.0 to 245	AV:42	TEMP_MTRW1
Comp Motor Wind 2 Temp	RO	°F	0.0	–40.0 to 245	AV:43	TEMP_MTRW2
Comp Motor Wind 3 Temp	RO	°F	0.0	–40.0 to 245	AV:44	TEMP_MTRW3
Comp Thrust Bearing Temp	RO	°F	0.0	–40.0 to 245	AV:37	TEMP_MTRB
Comp Thrust Lvg Oil Temp	RO	°F	0.0	–40.0 to 245	AV:36	TEMP_MTRB_OIL
Compressor is Running	RO		5		BV:49	CAPACTRL_comp_run
Compressor Ontime	RO	hour	0.0	0 to 500000.0	AV:99	RUNTIME_COMP_HRS
Compressor Run Contact	RO		OPEN	OPEN/CLOSE	BV:11	INPUTS_RUN_AUX
Compressor Start Contact	RO		OPEN	OPEN/CLOSE	BV:10	INPUTS_STAR_AUX
Compressor Start Relay	RO		OFF	OFF/ON	BV:28	OUTPUTS_COMP_SR
Compressor1 Run Status	RO			0 to 14†	AV:16	GENUNIT_cm_stas1
Compressor1 Run Status	RO			0 to 14	AV:200	MAIN_MS_lagstat
Cond Approach Alert	RO	°F	6	0.5 to 15	AV:272	CFGLIMIT_cond_al
Cond Entering Water Pres	RO	^psig	0.0	–6.7 to 420.0	AV:61	PRESSURE_COND_EWP
Cond Entering Water Pres	RO	psig	0.0	–6.7 to 420.0	AV:85	HYDRLIC_COND_EWP
Cond Flow Delta P Cutout	RO	psig	5	0.5 to 50	AV:274	CFGLIMIT_cond_cut
Cond Flow Input (mA)	RO	mA	0.0		AV:73	INPUTS_CONDFLIN
Cond Freeze Active	RO		NO	NO/YES	BV:45	MODES_condfrze
Cond Hi Flow Alarm	RO		DSABLE	DSABLE/ENABLE	BV:88	CFGLIMIT_cond_alm
Cond Hi Flow DP Limit	RO	psig	50	0.5 to 50	AV:275	CFGLIMIT_cond_val
Cond Leaving Water Pres	RO	^psig	0.0	–6.7 to 420.0	AV:62	PRESSURE_COND_LWP
Cond Leaving Water Pres	RO	psig	0.0	–6.7 to 420.0	AV:86	HYDRLIC_COND_LWP
Cond Press Cutout High	RO	psig	275	270 to 275	AV285	CFGLIMIT_cpcut_hi
Cond Press Cutout Low	RO	psig	160	155 to 160	AV:284	CFGLIMIT_cpcut_lo

LEGEND

AV — Analog Value
BV — Binary Value
RO — Read Only
RW — Read Write

*Object names are built from CCN table name and CCN point name combined for easy recognition.
†0 = OFF
1 = CTLTEST
2 = PUMPDOWN
3 = LOCKOUT
4 = RECYCLE
5 = TRIPOUT
6 = TIMEOUT
7 = PRESTART
8 = STARTUP
9 = AUTORST
10 = RAMPING
11 = RUNNING
12 = OVERRIDE
13 = DEMAND
14 = SHUTDOWN

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Cond Press Override Flag	RO		NO	NO/YES	BV:50	OVERRIDE_cpov_fl
Cond Press Override High	RO	psig	250	200 to 260	AV:277	CFGLIMIT_cpov_hi
Cond Press Override Low	RO	psig	140	90 to 150	AV:276	CFGLIMIT_cpov_lo
Cond Sat Refrig Temp	RO	c	–40.0	–40.0 to 245	AV:33	TEMP_COND_SAT
Cond water flow Status 0=Fail or Not Started 1=Success, 2=Verifying	RO			0 to 2	AV:94	HYDRLIC_cdw_fl_s
Cond Water Pulldown/Min	RO	^F	0.0	–20 to 20.0	AV:88	HYDRLIC_cdw_pull
Condenser Approach	RO	^F	0.2	0.0 to 99.0	AV:32	TEMP_cond_app
Condenser Freeze Point	RO	°F	34	–20 to 35	AV:270	CFGLIMIT_cdfreeze
Condenser Pressure	RO	^psig	–10.0	–6.7 to 420.0	AV:52	PRESSURE_COND_P
Condenser Type Low Pres=0,High Pres=1	RO		0	0 to 1	AV:214	FACTORY_cond_typ
Condenser Water Delta P	RO	psig	0.0	–6.7 to 420.0	AV:87	HYDRLIC_cdw_pd
Condenser Water Flow	RO		YES	NO/YES	BV:40	HYDRLIC_CDW_FLOW
Condenser Water Pump	RO		OFF	OFF/ON	BV:42	HYDRLIC_CDWP
Control Mode Local=0,Network=1 Remote=2,Local Sched=3	RO			0 to 3	AV:15	GENUNIT_ctl_mode
Control Point	RO				AV:18	GENUNIT_CTRL_PNT_rd
Control Point	RW	°F	45.0	10 to 160.0	AV:349	GENUNIT_CTRL_PNT_wr
Control Point Reset	RO	^F	0.00	–30.00 to 30.00	AV:19	GENUNIT_reset
Controlled DT Full Reset	RO	^F	10.0	–30.00 to 30.00	AV:13	RESETCFG_ctldt_fu
Controlled DT No Reset	RO	^F	0.0	0.0 to 15.0	AV:14	RESETCFG_ctldt_no
Controlled Fluid DB	RO	^F	1.0	0.5 to 2.0	AV:235	SERVICE1_ctrl_db
Controlled Water DT	RO	^F	0.0	–40.0 to 245	AV:93	HYDRLIC_ctrlw_dt
Controlled Water Temp	RO	°F	0.0		AV:110	CAPACTRL_ctrl_wt
Cooling ECW Setpoint	RW	°F	104.0	63.0 to 150.0	AV:344	SETPOINT_ecw_sp
Cooling LCW Setpoint	RW	°F	45.0	10.0 to 120.0	AV:347	SETPOINT_lcw_sp
Cooling/Heating Select	RO				AV:17	GENUNIT_HC_SEL_rd
Cooling/Heating Select	RW			0 to 1	AV:351	GENUNIT_HC_SEL_wr
Country Code	RO		86	0 to 500	AV:212	FACTORY_coun_cod
Current Alarm 1	RO				AV:105	ALARMRST_alarm_1c
Current Alarm 2	RO				AV:106	ALARMRST_alarm_2c
Current Alarm 3	RO				AV:107	ALARMRST_alarm_3c
Current Alarm 4	RO				AV:108	ALARMRST_alarm_4c
Current Alarm 5	RO				AV:109	ALARMRST_alarm_5c
Current Umbal Persist	RO	sec	5	1 to 10	AV:179	ISM_MCFG_cu_per
Current Umbal Threshold	RO	%	5	1 to 10	AV:175	ISM_MCFG_cu_th
Damper Valve Act Delay	RO	min	5	0 to 20	AV:243	SERVICE1_dmp_dly
Damper Valve Close	RO		ON	OFF/ON	BV:30	OUTPUTS_DMP_CL
Damper Valve Close DB	RO	psig	5.0	2.0 to 10.0	AV:246	SERVICE1_dmp_cldb
Damper Valve Full Closed	RO		NO	NO/YES	BV:12	INPUTS_DMP_FC
Damper Valve Full Opened	RO		NO	NO/YES	BV:13	INPUTS_DMP_FO
Damper Valve Open	RO		OFF	OFF/ON	BV:31	OUTPUTS_DMP_OP
Damper Valve Open DB	RO	psig	13.0	10.0 to 20.0	AV:247	SERVICE1_dmp_opdb
Damper Valve Status Cl=0,Inter=1,Op=2,Fail=3	RO		1	0 to 3	AV:63	INPUTS_DMP_ACT
Damper Valve Tgt Pos 0=CL,1=Hold,2=Open	RO		0	0 to 2	AV:83	OUTPUTS_dmp_tgt
Deg Reset Water DT Full	RO	°F	85.0	–40.0 to 245.0	AV:12	RESETCFG_drwdt_fu
Degrees Reset at 20mA	RW				AV:8	RESETCFG_der_20ma

LEGEND

AV — Analog Value
BV — Binary Value
RO — Read Only
RW — Read Write

*Object names are built from CCN table name and CCN point name combined for easy recognition.

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Delete ISM Config	RO		NO	NO/YES	BV:66	ISM_MCFG_del_ismc
Demand Limit At 20 mA	RO	%	40.0	10 to 100	AV:239	SERVICE1_dem_20ma
Demand Limit Prop Band	RO	%	10.0	3.0 to 15.0	AV:238	SERVICE1_dem_pdb
Demand Limit Source Amps=0,KW=1	RO		0	0 to 1	AV:5	GENCONF_DEM_SLCT
Demand Limit Source Amps=0,KW=1	RO			0 to 1	BV:82	MAIN_MS_DEM_SLCT
Demand Limit Type 0 = Base Demand,1=4-20ma	RO		0	0 to 1	AV:3	GENCONF_dem_sel
Demand Watts Interval	RO	min	15	5 to 60	AV:233	SERVICE1_dw_int
Derivatived EWT Gain	RO		2.0	1.0 to 3.0	AV:234	SERVICE1_ewtdgain
Deter Start Stop Command	RO				BV:1	GENUNIT_statstop
DGT Override Flag	RO		NO	NO/YES	BV:57	OVERRIDE_dgtov_fl
Diffuser Actual Pos	RO	%	0.0		AV:68	INPUTS_DIFF_ACT
Diffuser Fault	RO		NO	NO/YES	BV:63	MAIN_SRD_diffault
Diffuser Full Span mA	RO	mA	18.0	15.0 to 22.0	AV:292	CONF_SRD_diff_ma
Diffuser Option	RO		DSABLE	DSABLE/ENABLE	BV:89	CONF_SRD_diff_opt
Diffuser Output mA	RO	mA	2.0	4.0 to 20.0	AV:77	OUTPUTS_DIFF_OUT
Diffuser Pressure	RO	^psig	–10.0	–6.7 to 420.0	AV:57	PRESSURE_DIFF_P
Diffuser Target Pos	RO	%	0.0		AV:159	MAIN_SRD_diff_tgt
Discharge Superheat	RO	^F	0.0	–20.0 to 99.0	AV:35	TEMP_DSH
Economizer Pressure	RO	psig	–10.0	–6.7 to 420.0	AV:53	PRESSURE_ECON_P
Emergency Stop	RO	—	—	—	BV:4	GENUNIT_EMSTOP_rd
Emergency Stop	RW		0	0 to 1	BV:104	GENUNIT_EMSTOP_wr
Emergency Stop Contact	RO		OPEN	OPEN/CLOSE	BV:18	INPUTS_E_STOP
Enable Excessive Starts	RO		0	0 to 1	BV:87	SERVICE1_ex_start
Entering Chilled Water	RO	°F	0.0	–40.0 to 245	AV:25	TEMP_ECW
Entering Condenser Water	RO	°F	0.0	–40.0 to 245	AV:27	TEMP_ECDW
Evap Approach Alert	RO	°F	5	0.5 to 15	AV:271	CFGLIMIT_evap_al
Evap Design Approach	RO	°F	3	0 to 10	AV:339	CONF_PRG_ep_dgap
Evap Enter Water Pres	RO	psig	0.0	–6.7 to 420.0	AV:89	HYDRLIC_EVAP_EWP
Evap Entering Water Pres	RO	^psig	0.0	–6.7 to 420.0	AV:59	PRESSURE_EVAP_EWP
Evap Flow Delta P Cutout	RO	psig	5	0.5 to 50	AV:273	CFGLIMIT_evap_cut
Evap Flow Input (mA)	RO	mA	0.0		AV:72	INPUTS_EVAPFLIN
Evap Freeze Active	RO		NO	NO/YES	BV:44	MODES_evapfrze
Evap Leaving Water Pres	RO	^psig	0.0	–6.7 to 420.0	AV:60	PRESSURE_EVAP_LWP
Evap Leaving Water Pres	RO	psig	0.0	–6.7 to 420.0	AV:90	HYDRLIC_EVAP_LWP
Evap Override Delta T	RO	°F	3	2 to 5	AV:279	CFGLIMIT_ert_ovdt
Evap Refrig Liquid Temp	RO	°F	0.0	–40.0 to 245	AV:30	TEMP_EVAP_T
Evap Refrig Trippoint	RO	°F	33	0 to 40	AV:280	CFGLIMIT_ert_trip
Evap Sat Refrig Temp	RO	°F	–40.0	–40.0 to 245	AV:29	TEMP_EVAP_SAT
Evap Sat Temp @Shutdown	RO	°F	0.0	–40 to 280	AV:193	MAISWRST_est_shut
Evap water flow Status 0=Fail or Not Started 1=Success, 2=Verifying	RO			0 to 2	AV:95	HYDRLIC_chw_fl_s
Evaporator Approach	RO	^F	0.2	0.0 to 99.0	AV:31	TEMP_evap_app
Evaporator Pressure	RO	psig	–10	–6.7 to 420.0	AV:51	PRESSURE_EVAP_P
EWT Control Option	RO				BV:81	MAIN_MS_EWT_OPT
EWT Control Option	RW		DSABLE	DSABLE/ENABLE	BV:102	SETPOINT_EWT_OPT
Factory Password	RO		4444	0 to 65535	AV:216	FACTORY_fac_pass
Fire Security Interlock	RO		OPEN	OPEN/CLOSE	BV:23	INPUTS_FS_LOCK
Free Cooling Option	RO		NO	YES/NO	BV:84	FACTORY_freecool
Frequency=60 Hz?(No=50)	RO		NO	NO/YES	AV:181	ISM_MCFG_linefreq

LEGEND

AV — Analog Value
BV — Binary Value
RO — Read Only
RW — Read Write

*Object names are built from CCN table name and CCN point name combined for easy recognition.

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Gas Torque Factor	RO	°F	1	0.25 to 3.0	AV:314	CONF_OPT_gt_fact
Ground Fault CT Ratio:1	RO		150	150	AV:185	ISM_MCFG_gfct_rat
Ground Fault Current	RO	amp	15	1 to 25	AV:182	ISM_MCFG_gf_amps
Ground Fault Persistence	RO	cycles	5	1 to 10	AV:183	ISM_MCFG_gfp_pers
Ground Fault Phase 1	RO	amp	0.0		AV:130	POWER_GRFT_1
Ground Fault Phase 1	RO	amp	0.0		AV:152	MAIISMH_GRFT_H3
Ground Fault Phase 2	RO	amp	0.0		AV:131	POWER_GRFT_2
Ground Fault Phase 2	RO	amp	0.0		AV:151	MAIISMH_GRFT_H2
Ground Fault Phase 3	RO	amp	0.0		AV:132	POWER_GRFT_3
Ground Fault Phase 3	RO	amp	0.0		AV:150	MAIISMH_GRFT_H1
Ground Fault Protection	RO		ENABLE	DSABLE/ENABLE	BV:69	ISM_MCFG_gfp_en
Ground Fault Start Delay	RO	cycles	10	1 to 20	AV:184	ISM_MCFG_gfs_del
Guide Vane 1 Actual mA	RO	mA	0.00		AV:75	INPUTS_GV1_MA
Guide Vane 1 Actual Ohms	RO	ohms	0.0		AV:65	INPUTS_GV1_OHMS
Guide Vane 1 Decrease	RO		OFF	OFF/ON	BV:32	OUTPUTS_GV1_DEC
Guide Vane 1 Increase	RO		OFF	OFF/ON	BV:33	OUTPUTS_GV1_INC
Guide Vane/SRD Factor	RO		0.95	0.7 to 1.20	AV:315	CONF_OPT_gv_srd_f
Guide Vane1 Output mA	RO	mA	0.00	0.00 to 20.8	AV:82	OUTPUTS_GV1_OUT
Guide Vane1 Type 0=Dig Po 1=Ana 2=Dig Ne	RO		0	0 to 2	AV:222	FACTORY_gv1_type
GV1 Close Surge Prote	RO	%	3.0	2.0 to 4.0	AV:263	CFGSURGE_gvstp_sg
GV1 Closure at Startup	RO	%	4.0	0.0 to 40.0	AV:305	CONF_OPT_gv1stpos
GV1 Pos Load @25%	RO	%	6.4	0.0 to 83.0	AV:293	CONF_SRD_gv11_25
GV1 Pos Load @50%	RO	%	22.9	0.0 to 83.0	AV:294	CONF_SRD_gv11_50
GV1 Pos Load @75%	RO	%	41.3	0.0 to 83.0	AV:295	CONF_SRD_gv11_75
GV1 Position @Shutdown	RO	%	0.0	0 to 100	AV:192	MAISWRST_gv1_shut
GV1 Travel Limit	RO	%	80.0	30 to 100	AV:240	SERVICE1_gv1_lim
Head Pres Delta P 0%	RO	psig	25.0	20.0 to 85.0	AV:311	CONF_OPT_hdp_0
Head Pres Delta P 100%	RO	psig	50.0	20.0 to 85.0	AV:312	CONF_OPT_hdp_100
Head Pres Output mA	RO	%	0.0	0.0 to 100.0	AV:78	OUTPUTS_HDPV_OUT
Head Pres Valve Option	RO		DISABLE	DISABLE/ENABLE	BV:97	CONF_OPT_hdpv_opt
Head Pres Valve Tgt Pos	RO	%	0.0	0.0 to 100.0	AV:81	OUTPUTS_hdpv_tgt
Head Pressure Min Output	RO	%	0.0	0.0 to 100.0	AV:313	CONF_OPT_hdpv_min
Head Pressure Reference	RO	^psig	0.0	–6.7 to 420.0	AV:58	PRESSURE_HEAD_P
Heat Reclaim Option	RO		NO	YES/NO	BV:86	FACTORY_heatrecl
Heating ECDW Setpoint	RW	°F	104.0	63.0 to 150.0	AV:343	SETPOINT_ecdw_sp
Heating LCDW Setpoint	RW	°F	113.0	68.0 to 150.0	AV:346	SETPOINT_lcdw_sp
HGBP Change Flag Close=0,Hold=1,Open=2	RO		0	0 to 2	AV:122	MAISURGE_hgbp_chg
HGBP Close IGV1 Position	RO	%	10.0	1.5 to 20	AV:307	CONF_OPT_hgcl_gv1
HGBP Low Load DB	RO	^F	1.0	0.5 to 2.0	AV:310	CONF_OPT_hgbp_ldb
HGBP Off DT for Low Load	RO	^F	4.0	0.5 to 10.0	AV:308	CONF_OPT_hgb_toff
HGBP On DT for Low Load	RO	^F	2.0	0.5 to 10.0	AV:309	CONF_OPT_hgb_ton
HGBP Open IGV1 Position	RO	%	5.0	0.5 to 10.0	AV:306	CONF_OPT_hpop_gv1
HGBP Selection Disable=0, Surge=1 Low Load=2,Comb=3	RO		0	0 to 3	AV:304	CONF_OPT_hgbp_sel
HGBP Valve Fully Closed	RO		NO	NO/YES	BV:14	INPUTS_HGBP_FC
HGBP Valve Fully Opened	RO		NO	NO/YES	BV:15	INPUTS_HGBP_FO
HGBP Valve Is Configured	RO		DSABLE	DSABLE/ENABLE	BV:93	CONF_OPT_hgbp_opt

LEGEND

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*Object names are built from CCN table name and CCN point name combined for easy recognition.

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
HGBP Valve Status Cl=0,Inter=1,Op=2,Fail=3	RO		1	0 to 3	AV:64	INPUTS_HGBP_ACT
HGBP Valve Tgt Pos 0=CL,1=Hold,2=Open	RO		1	0 to 2	AV:84	OUTPUTS_hgbp_tgt
High Bearing Temp Over	RO		NO	NO/YES	BV:55	OVERRIDE_tbov_fl
High Lift Load @100%	RO	^F	67.5	0.0 to 100.0	AV:299	CONF_SRD_lf1_100
High Lift Load @25%	RO	^F	52.4	0.0 to 100.0	AV:300	CONF_SRD_lf1_25
High Lift Override Flag	RO		NO	NO/YES	BV:52	OVERRIDE_lftov_fl
High Motor Current Flag	RO		NO	NO/YES	BV:58	OVERRIDE_ampov_fl
High Motor Temp Over	RO		NO	NO/YES	BV:54	OVERRIDE_mtov_fl
High Pressure Switch	RO		OPEN	OPEN/CLOSE	BV:16	INPUTS_HP_SW
High VFD Current	RO		NO	NO/YES	BV:59	POWER_VFDC_HI
Hot Gas Bypass Close	RO		OFF	OFF/ON	BV:34	OUTPUTS_HGBP_OFF
Hot Gas Bypass Open	RO		OFF	OFF/ON	BV:35	OUTPUTS_HGBP_ON
HS Comp Bearing Temp	RO	°F	0.0	–40.0 to 245	AV:41	TEMP_MTRB4
HS Motor Bearing Temp	RO	°F	0.0	–40.0 to 245	AV:40	TEMP_MTRB3
Hydraulic System Option	RO		NO	YES/NO	BV:85	FACTORY_hyd_opt
I2T Sum Heat Phase 1	RO	%	0.0		AV:153	MAIISMH_sum1ht_h
I2T Sum Heat Phase 2	RO	%	0.0		AV:154	MAIISMH_sum2ht_h
I2T Sum Heat Phase 3	RO	%	0.0		AV:155	MAIISMH_sum3ht_h
Ice Build Contact Closed	RO		OPEN	OPEN/CLOSE	BV:19	INPUTS_ICE_CON
Ice Build Option	RO		DSABLE	DSABLE/ENABLE	BV:94	CONF_OPT_ice_opt
Ice Build Recycle	RO		DSABLE	DSABLE/ENABLE	BV:95	CONF_OPT_ice_recy
Ice Build Setpoint	RW	°F	40.0	15.0 to 60.0	AV:345	SETPOINT_ice_sp
Ice Build Termin Source 0=Temp,1=Contact,2=Both	RO		0	0 to 2	AV:317	CONF_OPT_ice_term
Ice Schedule Occupied	RO		NO	NO/YES	BV:6	GENUNIT_ice_occ
Identifier	RO		1600001	0 to 9999999	AV:342	BACNET_ident
ISM Config Conflict	RO		NO	NO/YES	BV:65	ISM_MCFG_ism_cflt
ISM Trip Relay Status	RO		OPEN	OPEN/CLOSE	BV:24	INPUTS_TRIPR
Lag Minimum Running Time	RO	min	0	0 to 150	AV:334	CONF_MS_lag_mini
LAG Shutdown Threshold	RO	%	50	25 to 75	AV:327	CONF_MS_lag_shut
LAG Start Time	RO	min	0	0 to 60	AV:201	MAIN_MS_lagstart
Lag Start Timer	RO	min	10	2 to 30	AV:331	CONF_MS_lstr_tim
LAG Stop Time	RO	min		0 to 60	AV:202	MAIN_MS_lagstop
Lag Stop Timer	RO	min	10	2 to 30	AV:332	CONF_MS_lstp_tim
Lead Lag Chiller Fault 0=No,1=Lead,2=Lag,3=Both	RO		0	0 to 3	AV:199	MAIN_MS_ll_fault
Lead Lag Communication	RO		0	0 to 1	BV:74	MAIN_MS_ll_comm
Lead Pulldown Time	RO	min	0	0 to 60	AV:333	CONF_MS_lead_pul
Lead/Lag Balance Delta	RO	hr	168	40 to 400	AV:330	CONF_MS_ll_bal_d
Lead/Lag Changeover?	RO				BV:77	MAIN_MS_ll_chang
Lead/Lag Hours Delta	RO	hour	0	–99999 to 99999	AV:206	MAIN_MS_ll_hr_d
Leaving Chilled Water	RO	°F	0.0	–40.0 to 245	AV:26	TEMP_LCW
Leaving Condenser Water	RO	°F	0.0	–40.0 to 245	AV:28	TEMP_LCDW
Line Current Phase 1	RO	amp	0.0		AV:125	POWER_LN_AMPS1
Line Current Phase 1	RO	amp	0.0		AV:146	MAIISMH_AMPS_H1
Line Current Phase 2	RO	amp	0.0		AV:126	POWER_LN_AMPS2
Line Current Phase 2	RO	amp	0.0		AV:147	MAIISMH_AMPS_H2
Line Current Phase 3	RO	amp	0.0		AV:127	POWER_LN_AMPS3
Line Current Phase 3	RO	amp	0.0		AV:148	MAIISMH_AMPS_H3

LEGEND

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*Object names are built from CCN table name and CCN point name combined for easy recognition.

APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Line Frequency Faulting	RO	Hz	0.0		AV:141	POWER_LN_FREQ
Line Frequency Faulting	RO	Hz	0.0		AV:149	MAIISMH_FREQ_H
Line Frequency Faulting	RO		DSABLE	DSABLE/ENABLE	BV:68	ISM_MCFG_lfref_en
Line Voltage Phase 1	RO	V	0.0		AV:133	POWER_LN_VOLT1
Line Voltage Phase 1	RO	V	0.0		AV:156	MAIISMH_VOLT_H1
Line Voltage Phase 2	RO	V	0.0		AV:134	POWER_LN_VOLT2
Line Voltage Phase 2	RO	V	0.0		AV:157	MAIISMH_VOLT_H2
Line Voltage Phase 3	RO	V	0.0		AV:135	POWER_LN_VOLT3
Line Voltage Phase 3	RO	V	0.0		AV:158	MAIISMH_VOLT_H3
Local Schedule Occupied	RO		NO	NO/YES	BV:5	GENUNIT_loc_occ
Local=0,Network=1	RO		1601	1 to 9999	AV:341	BACNET_network
Locked Rotor Start Delay	RO	cycles	5	1 to 10	AV:172	ISM_MCFG_lrs_del
Low Charge Cond Approach	RO	°F	20	20 to 40	AV:338	CONF_PRG_rch_cath
Low DSH Override Flag	RO		NO	NO/YES	BV:51	OVERRIDE_dshov_fl
Low Entered Volt V1 IOB	RO	V	17	17 to 19	AV:220	FACTORY_lv_enth
Low Exited Volt V2 IOB	RO	V	19	19 to 21	AV:221	FACTORY_lv_exth
Low Lift Load @25%	RO	^F	27.2	0.0 to 100.0	AV:301	CONF_SRD_lf2_25
Low Lift Profile Select	RO		3	1 to 5	AV:291	CONF_SRD_pro_sel
Low Sour Temp Over Flag	RO		NO	NO/YES	BV:56	OVERRIDE_lstov_fl
Low SST Override Flag	RO		NO	NO/YES	BV:53	OVERRIDE_sstov_fl
LS Comp Bearing Alert	RO	°F	185	155 to 190	AV:287	CFGLIMIT_tb_alt2
LS Comp Bearing Temp	RO	°F	0.0	–40.0 to 245	AV:39	TEMP_MTRB2
LS Comp Bearing Trip	RO	°F	200	185 to 210	AV:288	CFGLIMIT_tb_trip2
LS Motor Bearing Temp	RO	°F	0.0	–40.0 to 245	AV:38	TEMP_MTRB1
LWT Protection Setpoint	RO	°F	42.8	41 to 50	AV:289	CFGLIMIT_lwtp_sp
Master Chiller Position 0=Upstream, 1=Downstream	RO		0	0 to 1	AV:324	CONF_MS_ms_pos
Master Chiller Running	RO		0	0 to 1	BV:80	MAIN_MS_MST_RUN
Master Control Type 0=Local, 1=Network 2=Remote,3=Local Sched	RO		0	0 to 3	AV:197	MAIN_MS_ms_ctrl
Master Control Type 1=Local, 2=Network 3=Rem, 4= LS	RO		1	1 to 4	AV:322	CONF_MS_ms_ctrl
Master Lead Lag Select 0=Lead, Lag Once Failed 1=Lead/Lag Runtime Sel	RO		0	0 to 1	AV:325	CONF_MS_lead_sel
Master per Capacity	RO	%	50	25 to 75	AV:326	CONF_MS_ms_per
Master/Slave Ctrl Active	RO				BV:73	MAIN_MS_ms_act
Master/Slave Select 0=Disable 1=Master, 2=Slave	RO		0	0 to 2	AV:321	CONF_MS_msl_sel
Max Amps Change Value	RO	%	0.0		AV:117	MAISURGE_amch_max
Maximum Deg Temp Reset	RO	^F	10.0	–30.0 to 30.0	AV:9	RESETCFG_deg_rset
Maximum GV Movement	RO	%	2.0	2.0 to 4.0	AV:252	SERVICE1_max_gv
Maximum Pressure Ratio	RO		3.0000	1.0000 to 5.0000	AV:265	CFGSURGE_pr_max
MBB Power Calibration	RO		0.970	0.900 to 1.000	AV:251	SERVICE1_mbb_pfcl
Metric Unit	RO		1	0 to 1	BV:101	BACNET_bacunit
Minimum Brine LWT	RO	°F	34	10 to 34	AV:286	CFGLIMIT_bri_min
Minimum Pressure Ratio	RO		1.5000	1.0000 to 5.0000	AV:266	CFGSURGE_pr_min
Motor Actual Frequency	RO	Hz	0.0		AV:143	POWER_MOT_FREQ
Motor Current CT Ratio:1	RO		100	3 to 1000	AV:177	ISM_MCFG_ct_ratio
Motor Kilowatts	RO	kW	0.0		AV:138	POWER_KW
Motor Kilowatts Hours	RO	kW	0.0		AV:140	POWER_KWH
Motor Locked Rotor Trip	RO	amp	1000	100 to 65535	AV:171	ISM_MCFG_mot_lra

LEGEND

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APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Motor Percent Kilowatts	RO	%	0.0		AV:139	POWER_KW_P
Motor Rated Kilowatts	RO	kW	145	50 to 9999	AV:219	FACTORY_rkw
Motor Rated Line Voltage	RO	V	460	200 to 13800	AV:174	ISM_MCFG_rlv
Motor Rated Load Amps	RO	amp	200	10 to 5000	AV:170	ISM_MCFG_rla
MS Start Stop Command	RO		STOP	START/STOP	BV:7	GENUNIT_ms_stsp
Network:Cmd Occupied	RO				BV:3	GENUNIT_CHIL_OCC_rd
Network:Cmd Occupied	RW			0 to 1	BV:105	GENUNIT_CHIL_OCC_wr
Network:Cmd Start/Stop	RO				BV:2	GENUNIT_CHIL_S_S_rd
Network:Cmd Start/Stop	RO		0	0 to 1	BV:75	MAIN_MS_lag_s_s
Network:Cmd Start/Stop	RW			0 to 1	BV:103	GENUNIT_CHIL_S_S_wr
Oil Change Duration	RO	hr	8760	0 to 43800	AV:336	CONF_PRG_oilch_nt
Oil Filter Pres Diff	RO	psig	10	0 to 420	AV:335	CONF_PRG_oilfl_th
Oil Heater Relay	RO		ON	OFF/ON	BV:36	OUTPUTS_OIL_HEAT
Oil Press Verify Time	RO	sec	40	15 to 300	AV:248	SERVICE1_oilpvr_t
Oil Pump Delta P	RO	^psig	0.0	–6.7 to 420.0	AV:56	PRESSURE_OIL_PD
Oil Pump Relay	RO		OFF	OFF/ON	BV:37	OUTPUTS_OIL_PUMP
Oil Sump Pressure	RO	psig	–10.0	–6.7 to 420.0	AV:55	PRESSURE_OILP_SMP
Oil Sump Temp	RO	°F	0.0	–40.0 to 245	AV:45	TEMP_OILT_SMP
Oil Supply Pressure	RO	psig	–10.0	–6.7 to 420.0	AV:54	PRESSURE_OILP_DIS
Oil Supply Temp	RO	°F	0.0	–40.0 to 245	AV:46	TEMP_OILT_DIS
Over Under Volt Persist	RO	sec	5	1 to 10	AV:188	ISM_MCFG_ovud_per
Overrid Act Demand Limit	RO	%	100	10 to 100.0	AV:208	MAIN_MS_demlimov
Overrid Control Point	RO	°F	45.0	10 to 160.0	AV:207	MAIN_MS_ctrpntov
Overvoltage Threshold	RO	%	115	105 to 115	AV:186	ISM_MCFG_ovvol_th
Peak Detection Channel	RO		0	0 to 10	AV:303	CONF_SRD_peak_ch3
Peak Detection Threshold	RO	V	0.0000	0.0000 to 5.0000	AV:302	CONF_SRD_peak_th
Percent Line Voltage	RO	%	0.0		AV:137	POWER_VOLT_P
Percent Load Current	RO	%	0.0	0.0 to 999.0	AV:21	GENUNIT_amps_p
Percent Load Current	RO	%	0.0		AV:129	POWER_AMPS_P
Phase 1 Faulted	RO		NO	NO/YES	BV:60	MAIISMH_phase_h1
Phase 2 Faulted	RO		NO	NO/YES	BV:61	MAIISMH_phase_h2
Phase 3 Faulted	RO		NO	NO/YES	BV:62	MAIISMH_phase_h3
Power Down Active	RO		NO	NO/YES	BV:70	MAISWRST_power_dn
Power Factor	RO		0.000		AV:142	POWER_POW_FACT
Power Freq 60Hz Select	RO		NO	YES/NO	BV:83	FACTORY_freq_60h
Power Recovery Duration	RO	min	0.4	0 to 1	AV:194	MAISWRST_pd_dur
Power Recovery Timeout	RO	min	15	0 to 60	AV:316	CONF_OPT_pd_tcfg
Prestart Fault Time	RO	min		0 to 30	AV:203	MAIN_MS_preflt
Prestart Fault Timer	RO	min	5	2 to 30	AV:328	CONF_MS_pref_tim
Prog Function Enable	RO		NO	YES/NO	BV:99	CONF_PRG_prog_en
Proportional Dec Band	RO		6.0	2.0 to 10.0	AV:236	SERVICE1_gv1decdb
Proportional Inc Band	RO		6.5	2.0 to 10.0	AV:237	SERVICE1_gv1incdb
Pulldown Ramp Type 0 = Temp, 1 = Load	RO		1	0 to 1	AV:4	GENCONF_rampslct
Pulldown Time	RO	min		0 to 30	AV:204	MAIN_MS_pulltime
Pulldown: Delta T / Min	RO	^F	0	-0 to 100	AV:205	MAIN_MS_pull_dt
Pumpdown/Lockout State	RO			0 to 255	AV:96	HYDRLIC_pdown_st
Recovery Start Request	RO				BV:76	MAIN_MS_lag_rec
Recy Startup In 4 Hours	RO		0	0 to 6	AV:103	RUNTIME_RCYSTCNT
Recycle Restart Delta T	RO	^F	5.0	2.0 to 10.0	AV:245	SERVICE1_rcyst_dt

LEGEND

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APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Recycle Shutdown Delta T	RO	^F	1.0	0.5 to 4.0	AV:244	SERVICE1_rcysh_dt
Refrig Leak Alarm mA	RO	Ma	20	4 to 20	AV:318	CONF_OPT_leak_ma
Refrig Leak Sensor	RO	mA	0.0		AV:71	INPUTS_REF_LEAK
Refrigerant Leak Option	RO		DSABLE	DSABLE/ENABLE	BV:96	CONF_OPT_leak_en
Refrigerant Type R134a=0,Low Pressure=1	RO		0	0 to 1	AV:211	FACTORY_refg_typ
Remote Contact	RO		OPEN	OPEN/CLOSE	BV:17	INPUTS_REM_CON
Remote Reset Alarm	RO		0	0 to 1	BV:8	GENUNIT_REM_RST
Remote Reset Sensor	RO	°F	0.0	–40.0 to 245	AV:50	TEMP_R_RESET
Remote Temp Full Reset	RO	^F	10.0	–30.0 to 30.0	AV:10	RESETCFG_remtm_fu
Remote Temp No Reset	RO	°F	65.0	–40.0 to 245	AV:11	RESETCFG_remtm_no
Series Counter Flow	RO		NO	YES/NO	BV:98	CONF_MS_serct_fl
Service Ontime	RO	hour	0.0	0 to 500000.00	AV:100	RUNTIME_SRV_HRS
Service Password	RO		2222	0 to 9999	AV:232	SERVICE1_ser_pass
Single Cycle Dropout	RO		DSABLE	DSABLE/ENABLE	BV:67	ISM_MCFG_scycd_en
Slave Address	RO		2	1 to 236	AV:320	CONF_MS_slv_addr
Slave Control Type 0=Local, 1=Network 2=Remote,3=Local Sched	RO		0	0 to 3	AV:198	MAIN_MS_sl_ctrl
Soft Stop Amps Threshold	RO	%	70	40 to 100	AV:249	SERVICE1_sf_st_th
Spare Safety Input	RO		OPEN	OPEN/CLOSE	BV:21	INPUTS_SAFETY
SRD IGV Offset Select	RO		3	1 to 5	AV:290	CONF_SRD_off_sel
SRD Pos Load @25%	RO	%	73.5	0.0 to 100.0	AV:296	CONF_SRD_srd1_25
SRD Pos Load @50%	RO	%	35.1	0.0 to 100.0	AV:297	CONF_SRD_srd1_50
SRD Pos Load @75%	RO	%	19.5	0.0 to 100.0	AV:298	CONF_SRD_srd1_75
SRD Position @Shutdown	RO	%	0.0	0 to 100	AV:190	MAISWRST_srd_shut
SRD Rotating Stall Alarm	RO		NO	NO/YES	BV:64	MAIN_SRD_diff_alm
SRD Stall Closure Time	RO	min	0.0		AV:167	MAIN_SRD_stalltmr
Start to Start Delay	RO	min	15	4 to 45	AV:2	GENCONF_strt_dly
Start to Start Timer	RO	min	0.0	4.0 to 45.0	AV:102	RUNTIME_stst_tim
Starter Fault Feedback	RO		OPEN	OPEN/CLOSE	BV:22	INPUTS_STARTFLT
Starter LRA Rating	RO	amp	2000	100 to 65535	AV:173	ISM_MCFG_str_lra
Starter Trans Sw Status	RO		OFF	OFF/ON	BV:29	OUTPUTS_TRANS
Starter Type 0=Full Volt 1=Redu Volt 2=Solid State 3=FS VFD	RO		0	0 to 3	AV:169	ISM_MCFG_star_typ
Starter Type Full=0,Reduced Voltage=1 Solid State=2,VFD=3	RO		0	0 to 3	AV:218	FACTORY_startype
Starts In 12 Hours	RO		0	0 to 8	AV:97	RUNTIME_ST_CNT12
Stop Override	RO		0	0 to 1	BV:9	GENUNIT_STP_OVER
Stop to Start Delay	RO	min	2	1 to 15	AV:1	GENCONF_min_off
Stop to Start Timer	RO	min	0.0	1.0 to 15.0	AV:101	RUNTIME_spst_tim
Surge Counts	RO		0		AV:118	MAISURGE_sc
Surge Deadband	RO	^F	1.5	0.5 to 3.0	AV:258	CFGSURGE_sghg_db
Surge Delay Time	RO	sec	15	0 to 120	AV:268	CFGSURGE_surg_del
Surge Delta Amps %	RO	%	20	5 to 40	AV:262	CFGSURGE_surge_a
Surge IGV1 Max Pos	RO				AV:255	CFGSURGE_gv1_smax
Surge IGV1 Min Pos	RO				AV:256	CFGSURGE_gv1_smin
Surge Line High Offset	RO	^F	1.5	0.1 to 3.0	AV:259	CFGSURGE_sgl_hoff
Surge Line Offset	RO	^F	2.0	1.0 to 3.0	AV:257	CFGSURGE_sgl_off
Surge Line Shape Factor	RO				AV:260	CFGSURGE_sgl_shpf
Surge Line Speed Factor	RO		2.00	0.00 to 3.00	AV:261	CFGSURGE_sgl_spdf
Surge Prevention Active	RO		NO	NO/YES	AV:119	MAISURGE_surg_act

LEGEND

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APPENDIX D — BACnet OPTION (cont)

Table C — BACnet Point Table (cont)

POINT DESCRIPTION	READ/ WRITE	UNITS	DEFAULT VALUE	RANGE	BACNET OBJECT ID	BACNET OBJECT NAME*
Surge Protection Active	RO		NO	NO/YES	AV:121	MAISURGE_surg_pro
Surge Protection Counts	RO				AV:120	MAISURGE_spc
Surge Region No=0,Low=1,High=2	RO			0 to 2	AV:113	MAISURGE_act_reg
Surge Time Period	RO	min	8	7 to 10	AV:269	CFGSURGE_surge_t
Swift Restart Active	RO		NO	NO/YES	BV:72	MAISWRST_sw_rst
Target GV1 Pos	RO	%	0.0		AV:111	CAPACTRL_gv1_tgt
Target VFD Speed	RO	%	0.0		AV:112	CAPACTRL_vfd_tgt
Temp Ramp Rate F/Min	RO	^F	3	1 to 10	AV:242	SERVICE1_tmramprt
Temp Reset Type No=0,4~20ma=1 Remote Temp=2,Water DT=3	RO			0 to 3	AV:7	RESETCFG_res_sel
Total Compressor Starts	RO		0	0 to 99999	AV:98	RUNTIME_C_STARTS
Tower Fan High Setpoint			75	55 TO 105	AV:319	CONF_OPT_tfh_sp
Tower Fan Relay High	RO		OFF	OFF/ON	BV:38	OUTPUTS_TFR_HIGH
Tower Fan Relay Low	RO		OFF	OFF/ON	BV:39	OUTPUTS_TFR_LOW
Trans Calib Threshold	RO				AV:337	CONF_PRG_refgc_th
Under Volt Start Delay	RO	sec	1		AV:189	ISM_MCFG_uvs_del
Undervoltage Threshold	RO	%	85	85 to 95	AV:187	ISM_MCFG_udvol_th
Unit is Lead or Lag 0=Disable,1=Lead,2=Lag	RO		0	0 to 2	AV:196	MAIN_MS_lead_lag
Unit is Master or Slave 0=Disable, 1=Master, 2=Slave	RO		0	0 to 2	AV:195	MAIN_MS_mst_slv
Unit Type Cool Only=0,Heat Mach=1	RO		0	0 to 1	AV:210	FACTORY_unit_typ
Unload Threshold	RO	%	100	50 to 100	AV:329	CONF_MS_un_th
User Password	RO				AV:6	USERCONF_use_pass
VDO High Lift Load Line	RO	^F	0.0	0.0 to 200.0	AV:48	TEMP_LIFT_1
VDO High Lift Load Line	RO	^F	0.0		AV:164	MAIN_SRD_lift_1
VDO Logic Start Delay	RO	min	0.0		AV:166	MAIN_SRD_strt_tmr
VDO Low Lift Load Line	RO	^F	0.0	0.0 to 200.0	AV:49	TEMP_LIFT_2
VDO Low Lift Load Line	RO	^F	0.0		AV:165	MAIN_SRD_lift_2
VFD Current Actual mA	RO	mA	0.00		AV:76	INPUTS_VFDC_MA
VFD Current Limit	RO	amp	250	0.0 to 99999.0	AV:229	CONF_VFD_vfdculm
VFD Feedback Voltage Sel 0=0~5V 1=0~10V	RO		0	0 to 1	AV:223	FACTORY_vfd_fdv
VFD Gain	RO		0.75	0.10 to 1.50	AV:224	CONF_VFD_vfd_gain
VFD Load Current	RO	amp	0.0		AV:145	POWER_VFD_LOAD
VFD Load Current 20mA	RO	amp	200.0	10.0 to 5000.0	AV:230	CONF_VFD_vfdc20ma
VFD Load Factor	RO		0.000		AV:144	POWER_VFD_FACT
VFD Maximum Speed	RO	%	100.0	90.0 to 110.0	AV:225	CONF_VFD_vfd_max
VFD Minimum Speed	RO	%	70	65.0 to 100.0	AV:226	CONF_VFD_vfd_min
VFD Option No =0,FS VFD=1,UM VFD=2	RO		0	0 to 2	AV:217	FACTORY_vfd_opt
VFD Speed @Shutdown	RO	%	0.0	0 to 100	AV:191	MAISWRST_vfd_shut
VFD Speed Feedback	RO	V	0.0		AV:74	INPUTS_VFD_IN
VFD Speed Output mA	RO	mA	4.0	4.0 to 20.0	AV:80	OUTPUTS_VFD_OUT
VFD Speed Step Surge	RO	%	1.5	1.0 to 5.0	AV:264	CFGSURGE_vfdstpsg
VFD Start Speed	RO	%	80.0	65.0 to 100.0	AV:227	CONF_VFD_vfd_str
VFD Surge Line Gain	RO		2.0	2.0 to 3.5	AV:228	CONF_VFD_vfd_slg
Volt Transformer Ratio:1	RO		1	1 to 115	AV:178	ISM_MCFG_vt_rat
Voltage Umbal Persist	RO	5	sec	1 to 10	AV:80	ISM_MCFG_vu_per
Voltage Umbal Threshold	RO	%	5	1 to 10	AV:176	ISM_MCFG_vu_th
Water Flow Verify Time	RO	min	5.0	0.5 to 5.0	AV:250	SERVICE1_wflow_t
Water Pressure Option	RO		DSABLE	DSABLE/ENABLE	BV:92	CONF_OPT_wp_opt

LEGEND

AV — Analog Value
BV — Binary Value
RO — Read Only
RW — Read Write

*Object names are built from CCN table name and CCN point name combined for easy recognition.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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